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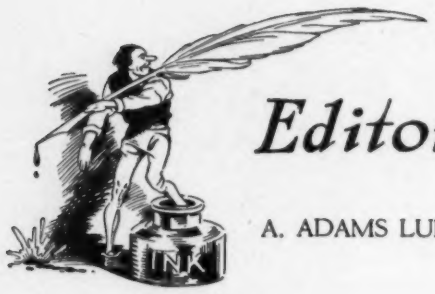


Editorial

A. ADAMS LUND, Editor

The Calendar Remains Unchanged

A FRIEND of ours dolefully remarked: "Nobody wants to see me. The customers hang me up. Everybody seems to be busy losing money. *I don't even want to go to Heaven when I think where all the business has gone.*"

Several of our other friends are prepared to cut the biggest "melons" in their respective business histories. One wonders if possibly the ability, initiative and mental attitude of the individual company hasn't something to do with it.

We looked over the 1930 calendar after our friend had spoken to us and were surprised to find the usual quota of holidays and big business seasons all listed in their accustomed positions. The more we studied that calendar, the more we realized that when Easter and Mother's Day and all other holidays rolled around, people would be buying and eating candy just as though they didn't know that there had been a financial crisis in 1929.

It all gets back to the old truism "The race is to the swift." If 1930 looks to you like a success of major calamities—why, in all probability it will be *just* that—for *you*. But if you feel that the business is there to be gotten, you will go out and get it and stop all the conversation.

A Candy-Eaters' Contest

THE Editor of THE MANUFACTURING CONFECTIONER has a suggestion to offer to the advertising headquarters of the N. C. A.

We hear a lot of talk about "candy consciousness"—about making consumers candy conscious. Now after all, what is it that creates candy consciousness—what makes a woman, or a man or a child want to eat candy?

Is it Sweetness? Energy? Health? Or just plain human psychology? What makes the passer-by who pauses at a candy window go in and buy? A creamy fudge—a succulent cordial—a cooling, crystal-clear mint—what makes your mouth water as you read the copy man's lines?

Thinking about candy does it. *Seeing* candy appetizingly displayed, *reading* about candy intriguingly depicted—it is *thinking* about candy, picturing ourselves in an attitude of eating candy—that creates in us a desire for candy.

But what if we induce twenty, thirty, fifty, or a hundred thousand children and able-bodied grownups to *write* about candy? To describe the rapture of their first candy purchase? To tell why they are so fond of candy, and why it is right that *they* should be fond of it?

Why not a nation-wide candy eater's contest, with prizes for the best word pictures on the joys and zests of candy eating. Such a contest would accomplish a threefold purpose: (1) make more people *think* of candy, and therefore greedy to eat candy while the thought is upon them; (2) attract widespread attention to the healthfulness and desirability of candy, at a minimum of advertising expense; (3) provide a great mass of usable testimonial, and copy material for subsequent advertising campaigns.

It is just a thought. Maybe the N. C. A. or one of the larger manufacturers might care to do something about it.

Weed Out the Ne'er-do-Wells

A FACTORY with a help turnover of 20 per cent per annum might be thought of as being in a bad way. Yet the mortality among confectionery businesses throughout the United States has reached this alarming total.

For every 800 firms which survive the vicissitudes of mounting distributing costs and diminishing profits, 200 must pay the penalties of inadequacy or unpreparedness. But never mind. Like Jason's men, a new crop will spring up over night.

Now it is no credit to the candy industry that it attracts so many of the incompetents who have failed to make a go of other businesses. It is like a school with low entrance requirements. It suggests the unfortunate implication that the standards of the industry are low enough for any old misfit to meet.

Who but the present personnel of the industry can raise these standards? Why not begin now by making candy so good and manufacturing and distributing it so efficiently that the ne'er-do-wells of other industries will think twice before plunging in!

Losing at the Bung

WHAT happens when the industry goes "production-minded?" During the past decade, production costs throughout most of the industry have declined 20 per cent. A wholesome saving. But in the same period, distribution costs have risen nearly 30 per cent, which reminds us vaguely of Einstein's theory of *relativity*. The pocket into which we put all our savings, had a fairly large hole in it.

The answer lies in cutting down waste—waste in selling—waste resulting from the adoption of trick policies of advertising. There is still time to overhaul the distribution budgets for 1930 to see that we get "value received" for every dollar expended.

Are the Good Names All Pre-empted?

SCURVY-ETTA, Kluck's-Luck, Hunk-o-Junk. Names-names-names. Names have been the damnation of products and the ruination of industries. Names have been the making of others.

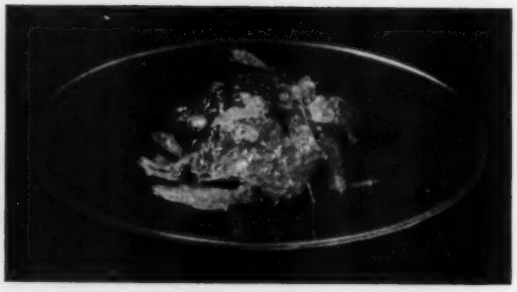
Bar names, package names, bulk names—foolish names, weird names, names which betray a wholesale "moronry." How can we expect to inspire confidence toward candy in the minds of the consuming public if we give the lie to our intelligence in every brand name we coin? Is candy a joke? Do we lack the inventive genius to coin names which will live after us? Or are the good names all pre-empted?

Do you read the N. C. A.'s trade mark search bulletins? You must. They are much too funny to miss. They are the spice on the candy program. Amusing—were they not so pathetically absurd.

What's in a brand name? Aside from their ridiculousness, silly brand names reveal a weakness of the candy industry. The multiplicity of names for the same generic sweet suggests an instability, a "here-to-day-and-gone-tomorrow" atmosphere which is inimical to the best interests of the industry as a whole.

A new name does not make a new bar. If the dress is poor and the quality worse, changing the name from "Flora-whoozis" to "Tin Pan Alley" won't help matters. The trade all know it is the same old monstrosity in disguise.

The successful bars are those which, irrespective of name, are constantly improved and consistently and efficiently advertised.



A sample of lecithin produced experimentally from corn germ oil. The bulk of the commercial production comes from the soya bean and is manufactured in Germany, where one factory is producing it at the rate of two tons daily.

Using Lecithin to C
Fluidity of C

Materials presaging huge savings to coating users may also hold solution to surplus powder problem

THE Lecithin used was the lipoid extracted from Soya beans, together with soya bean oil, giving an average composition of:

60% lecithin,

40% Soya bean oil.

A determination of P_2O_5 gave 5.25% which is in agreement with 60% lecithin (factor 11.37 x P_2O_5).

A chocolate with a normal fat content (say 33%) cannot be considered as a liquid even at temperatures considerably above the melting points of its constituent fats. The expression "plastic solid" may be applied as the nearest definition. A suspension of inert solid particles in the fat is the actual state; at all events, measurements of the apparent viscosity have been carried out by the falling sphere method. This estimation gives quite good comparative results and readily shows the effect of lecithin on the original viscosity of the chocolate. As stated, the measurement of viscosity affords the most delicate means of tracing slight changes in colloidal solutions. In the case of emulsions, the usually accepted theory accounting for decreased viscosity is that the emulsifying agent forms a membrane (or film) around the oil globules and so prevents their coalescence.

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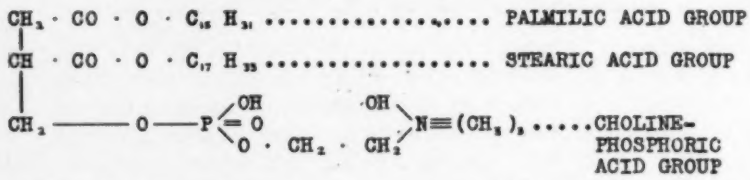
The results are clear. *Lecithin has the definite effect of making a chocolate much more fluid.* The following experiments were all carried out on the 20 lb. scale in a small melangeur at a suitable temperature. The viscosities are returned in seconds, this being the time taken for a bronze sphere weighing 9.5 grams (including a piece of rigid wire marked off at two points 10. c. m. apart), to sink through the chocolate from one mark to the other. The sphere was in each case immersed in the chocolate to the first mark before the release and time reading was made. All the viscosities were carried out at 33° C. in a standard shaped tin containing 2 lbs. of chocolate.

LECITHIN (Formula)


CH₂ · CO · O · C₁₅ H₃₁ ..... PALMILIC ACID GROUP
CH · CO · O · C₁₇ H₃₃ ..... STEARIC ACID GROUP
CH₂ —— O —— P(OH, =O, O · CH₂ · CH₂ OH) N≡(CH₃)₃ .....CHOLINE-PHOSPHORIC ACID GROUP

EXPERIMENTS:

Plain chocolate, containing 34.7% *fat.* By falling sphere method; (9.5 grams)—10 cm. fall.

Time 6 *seconds.*

20 lbs. of the above chocolate run down in small melangeur, 0.5% of the lecithin compound melted together with 0.5% cacao butter added.

After running in machine for 10 minutes, the same method was applied for the measurement of fluidity.

Time—1 *second.*

The remarkable reduction of viscosity is out of all proportion to the 1% *of fatty materials added.*

Several reasons could be given, but the one which has the greatest effect is probably the removal of occluded air which is brought about by the presence of the lecithin.

Air is slowly removed and chocolate is made more fluid by prolonged stoving in the ordinary processes, but the action of lecithin is far greater than this simple heating.

This means a large monetary saving for the manufacturer since the fat is the most costly item.

(2) *Plain chocolate, containing* 28% *of fat:* This sample was too plastic for a control measurement. As before, 20 lbs. were treated with 0.5% of lecithin and 0.5% cacao butter.

An immediate change took place, the plastic mass running down into a very thin stream.

Viscosity measurement: time—10 seconds.

(3) *Milk chocolate—containing* 33% *fat:*

Viscosity control—time 7 seconds.

(4) *Milk chocolate, containing* 28% *fat:* Viscosity too plastic for measurement—with lecithin 0.5% and cacao butter 0.5%.

Viscosity: Time—2½ seconds.

(5) *Milk chocolate, containing* 25% *fat:* With lecithin and 0.5% cacao butter.

Viscosity: Time—5 seconds.

(6) *Plain chocolate containing substitute butter;* 30% *fat content:*

Control-time: 19.5 seconds.

With 0.5% lecithin: Time—2 seconds.

Measurements made on the same samples after the addition of increasing quantities of lecithin are shown in the following tables:

to Control *the* of Chocolate

By

A. I. C.—England

(7) **PLAIN CHOCOLATE, CONTAINING 28% FAT:**

Lecithin (%)	Apparent Viscosity (seconds)	Fat (%)
0.	Too Plastic	28.0
0.1	Too Plastic	28.1
0.3	21	28.3
0.5	9	28.5
0.7	9	28.7
0.9	11	28.9

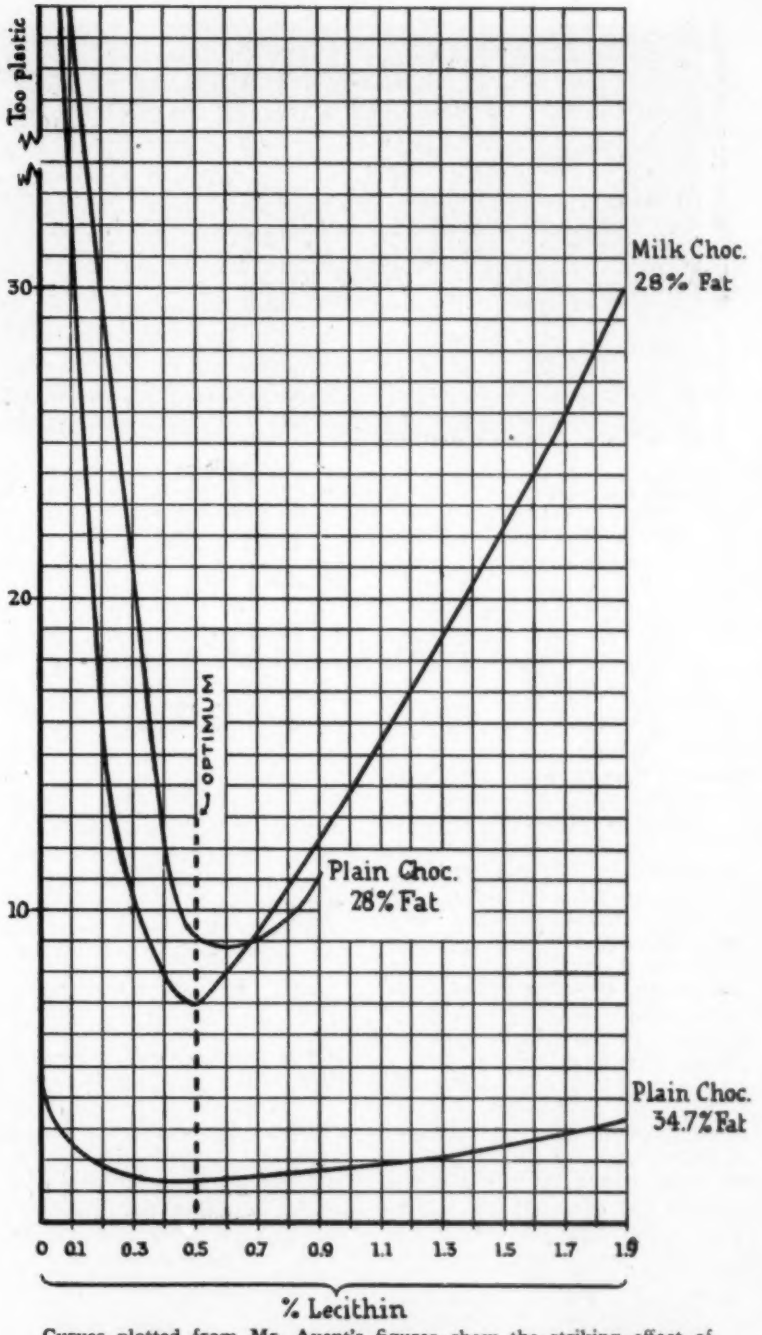
PLAIN CHOCOLATE CONTAINING 34.7% FAT:

0.	4½	34.7
0.1	2½	34.8
0.3	1½	35.0
0.5	1½	35.2
0.7	1½	35.4
0.9	1-4/5	35.6
1.1	1-4/5	35.8
1.3	2	36.0
1.5	2½	36.2
1.7	3	36.4
1.9	3¼	36.6

MILK CHOCOLATE CONTAINING 28% FAT:

Lecithin (%)	Apparent Viscosity (Seconds)	Fat (%)
0.	Too Plastic	28.0
0.1	Too Plastic	28.1
0.3	10	28.3
0.5	7	28.5
0.7	10	28.7
0.9	13	28.9
1.1	14	29.1
1.3	18	29.3
1.5	24	29.5
1.7	25	29.7
1.9	30	29.9

From the above results, the optimum quantity of lecithin to add in order to obtain the greatest fluidity is 0.5%. *Higher percentages appear to have the opposite effect,* probably due to the physical nature of lecithin (melting point about 70° C.).



Curves plotted from Mr. Avent's figures show the striking effect of comparatively small percentages of lecithin upon the viscosity of chocolate. The indicated saving of upwards of 5 per cent of the total butter content of the chocolate represents a tremendous economy when translated in terms of added butter; i. e., the amount of butter required to be added to the liquor in order to obtain satisfactory fluidity for dipping. If these results are substantiated in general practice, this development might very well change the structure of the entire cocoa butter industry. (Note that the percentage of lecithin producing most beneficial results is a more or less exact one and that increasing the amount of lecithin produces an opposite result!)

The outcome of this work is an enormous economy of chocolate fats, and if carried out universally would cause a serious slump in the demand for market cacao butters and Borneo tallows.

According to Mr. Edwards, chocolate must be added to the list of confectionery materials which owe their behavior to protective colloids. Above are a few of the more common protective colloids employed in the food industries (left to right), top: agar-agar, gelatine, fruit pectin, gum arabic; below: egg albumen, lecithin, corn starch. The function of these true colloids is to help stabilize a colloidal mixture which is near the balancing point.

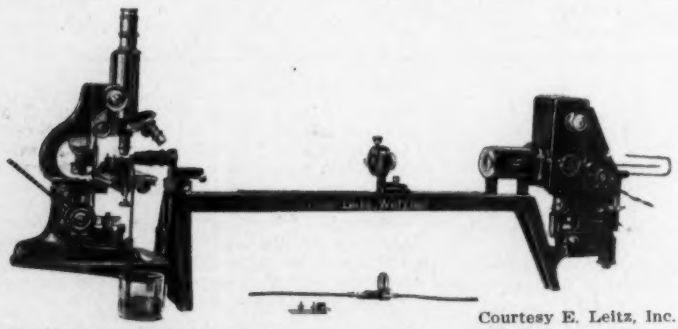
Chocolate, *the* Colloid

By EUGENE B. EDWARDS

THE chemistry of colloids has advanced in recent years from the status of a neglected theory to the position of one of the most widely discussed phenomena of nature.

Colloids are present in everything around us. The foods we eat, the clothes we wear, the air we breathe —even our bodies are largely composed of colloids. The universe is sprinkled with colloid star-dust; leather is largely colloidal in its composition; gelatine is wholly colloidal, as are all jellies and gums; in fact, the colloid is as ubiquitous as its near-relative the molecule in that at some time all matter is in a colloidal form.

The modern conception of matter has been evolved from a mass of conflicting testimony. Seemingly a finished theoretical structure today, its conclusions are still freely challenged and are constantly being revised and amplified to conform to new evidence which is being adduced daily. The colloid is the factor in the present theory which has perhaps seen the greatest shifting of opinion, possibly because its manifestations are within the range of visual check. From the mass of tests and observations there has been evolved a very workable theory —one sufficiently well grounded to insure that future developments will be more likely to add to it than to supersede it.



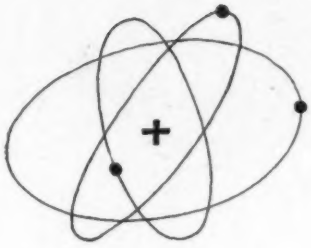
Courtesy E. Leitz, Inc.

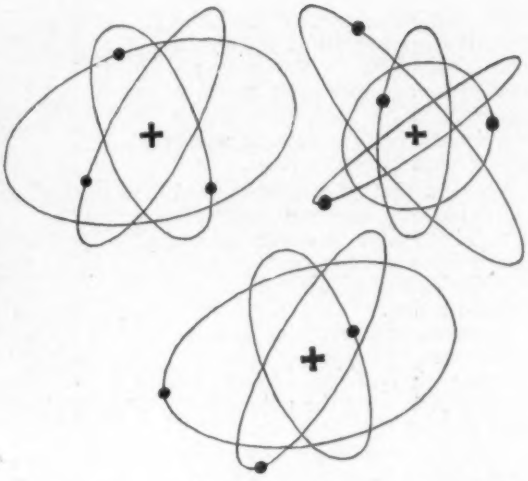
The behavior of colloids became known with the perfection of the ultramicroscope which records by means of reflected light the activities of particles too small to be visible to the ordinary microscope.

What Is a Colloid?

Before discussing colloids, a word about the composition of matter may not be amiss. The beginning of things is understood to be electrical. Tiny charges of negative electricity revolving around an equally tiny positive charge, their relative positions changing constantly—the basic conception of matter is a miniature universe. These charges are known as *electrons.* Specific groupings of these electrons form the atoms which in turn make up what we know as *elements.* These elements are extremely stable, the breaking down of the atom only being effected over measureless periods of time. When under certain conditions the atoms of different elements combine, we get chemical change with the formation of the *molecule,* a semi-permanent compound.

Any change in the structure of a material which does not entail such a *chemical* change is termed *physical,* i. e., the change is unstable and in appearance only. The *colloid* is physical in its manifestations. Strictly speaking, it is a sub-division of matter which closely approaches the molecule in size, but which stops





The atom (left) is pictured as a miniature universe with one or more tiny negative charges of electricity (electrons) revolving in definite orbits around an equally tiny charge of positive electricity (protons). When these specific groupings of electrons unite with other and different groupings of electrons the result is a molecule, which is the smallest division of a chemical compound (right).

just short of chemical change. The nearer the colloid approaches to molecular size, the more it behaves like one, and in this lies the value of this phenomenon.

The same forces which hold the celestial bodies in their respective places, the balanced forces of magnetic attraction, function in exactly the same manner in these small subdivisions of matter from the electron up. There is an intense activity, seemingly without meaning, but all according to well defined laws. The nearer the sub-division of matter gets the basic electron, the more active these magnetic forces become. Their power increases as the surface of the particles increases in proportion to their mass. Colloidal size begins in actual fact when this interfacial attraction just balances the force of gravity.

Colloids are exceedingly minute. They cannot be distinguished by direct vision microscopes. Their presence can only be detected by an instrument known as the ultramicroscope, which uses the reflection given off by the colloids when exposed to a ray of light, the colloids showing up much as specks of dust do when a ray of sunshine falls upon them.

The Colloidal Phenomenon

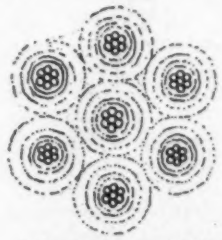
The power of finely divided matter to counteract the force of gravity and, by balancing the magnetic attraction, to stay apart is what is known as the colloidal phenomenon. Experiment has shown that this power takes a myriad of forms and that its action is varied in many ways by outside influences so that what may be true of a certain manifestation under certain conditions cannot be used as a basis for predicting what will happen under other conditions.

Recognition of the power of the colloid and its premeditated application to industrial processes is becoming more general every day. As industrial chemists realize more and more that the colloid has always been at work and that most of our present manufacturing processes have been dependent upon its aid, they become aware that the results which they have ascribed to this or that method of manufacture were not due to the method itself, but to the use which it made of colloids. This belated recognition of the dominant part played by colloidal action has speeded up manufacture and in numberless instances made possible the building of new products.

Not only is extremely fine subdivision a necessary adjunct of the colloidal condition, but the subdivision of the particles must be uniform, i. e., all particles of the same size. Should the particles be irregular in size, the resulting interfacial would also be irregular, the smaller fragments attaching to the larger, with a consequent building up of aggregates which would get beyond the balance point and be deposited out of the mixture. This aspect of the colloidal condition is in evidence in all products of grinding. It is the reason why fine powders, which should otherwise stay in suspension, precipitate.

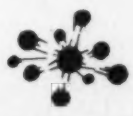
Importance of Uniform Size

It has proved impossible to mechanically reduce solid materials to an even colloidal dimension, only part of the resulting powder being in the colloidal range. Although due in part to the immense increase

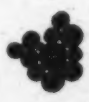


1. In the true colloid, the colloidal particles are of equal size, held apart by a balancing of the forces of magnetic attraction.

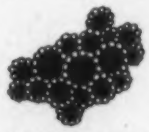
2. Showing how particles resulting from grinding are made up of a number of molecules. The more nearly these particles approach molecular size, the more colloidal the product is in its behavior.



3. In the ordinary subdivision of matter, where the particles are of unequal size, there is a tendency for the small particles to bond to the large.



4. Showing the formation of an aggregate as a result of the bonding action of uneven sized particles.



5. The true or protective colloid is interposed to prevent this bonding action and help stabilize mixtures which are near the balancing point.

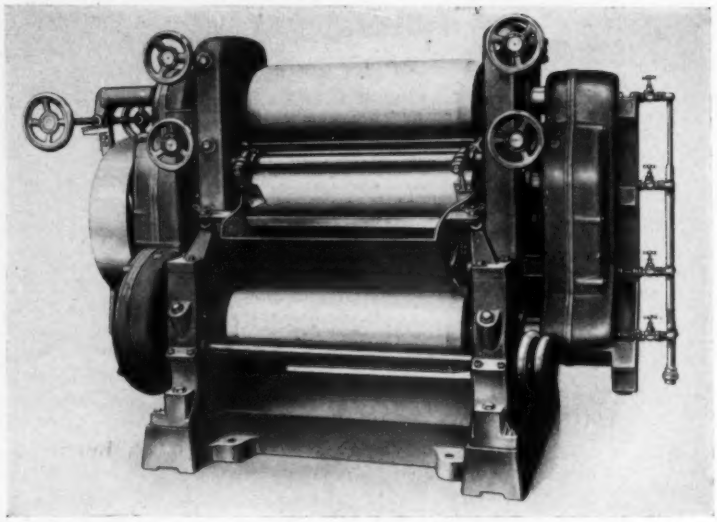
in the number of particles resulting from the disintegration, it is even more attributable to the same attraction or adsorption which binds the small to the large pieces, continued grinding merely bonding these groups closer together.

The fact that true colloids must be of uniform size and that it is almost impossible to create such a fine division mechanically apparently limits the specific uses of the colloidal action.

However, nature has stepped in at this point by supplying an almost endless variety of true colloids, all of them possessing the property of being able to help stabilize a mixture which is near the balancing point. When used in this manner, the substances are termed *protective* colloids and include gelatines, gums, proteids and such substances as cocoa butter, which are liquid at high temperatures.

Not only do these protective colloids help to keep true colloidal dispersions in a stable condition, but they exert the same influence where a large proportion of the dispersion is above colloidal dimensions. Milk is a good example of a true colloidal mixture held stable by the protective colloid lactalbumen. As soon as this colloid is coagulated the balance is broken and the other components precipitated. The protective colloid has made possible many diversified products of a familiar nature. Mayonnaise, ice cream, emulsions of all kinds, and the material most important to our discussion, chocolate.

Viscosity is due entirely to colloidal dispersion, and varies in proportion to the volume of solids suspended in the liquid. The action of the suspended solids varies also according to the extent to which they are affected by such conditions as temperature. Viscosity is of particular interest to the user of chocolate inasmuch as the final appearance of the product depends so much upon it. All who know anything of the product are familiar with the fact that a coarsely ground chocolate lacks the body of one that is finely ground.



Courtesy J. M. Lehman Co.

A Liquor Mill by Lehman

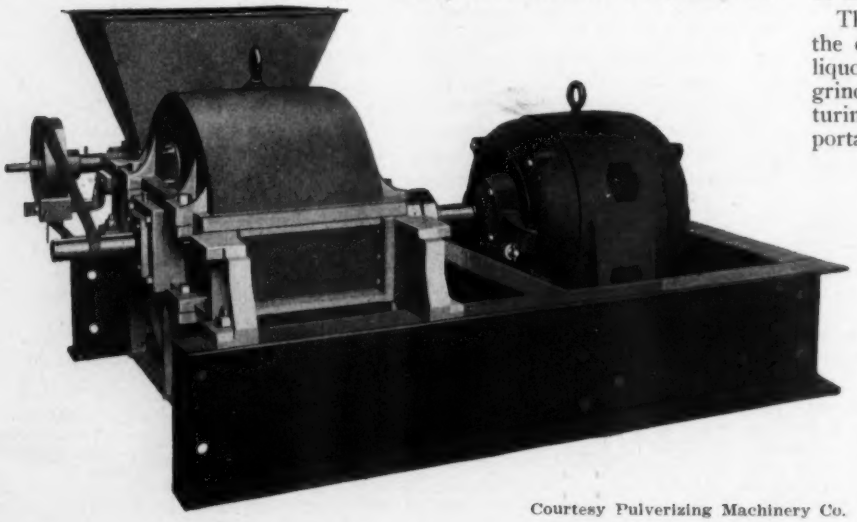
Chocolate and the Colloid

And now you see how the chemistry of colloids is pertinent to the study of chocolate. Practically all of the processes involved in the manufacture of chocolate have been developed in order to create a colloidal condition. Every major improvement in refining has been a blind effort to amplify that condition.

The roasting of cocoa beans has no direct influence on the final colloidal content or dispersion except that as roasted beans grind more easily it helps in the final disintegration. Over-roasting, however, not only burns many of the more fragile of the natural colloids in the cocoa, but breaks down some of the softer fats of the cocoa butter, starting a whole line of chemical reactions which seriously affect the properties of the butter as a protective colloid.

The first actual disintegration of the cocoa solids takes place in the liquor mill. The fineness of the grind at this point in the manufacturing process is not of supreme importance to the final quality of the

(*Continued on Page 63*)



A pulverizer of the type used extensively for sugar grinding.

Courtesy Pulverizing Machinery Co.

Now, that's a question —

Every month the Editor asks ten questions which every intelligent candy man should know. How do YOU rate on these questions?

1. Why is it that the better grades of chocolate ordinarily resist graying better than the cheaper grades?
2. Why do finely milled coatings require the addition of less flavor than coarsely ground coatings?
3. To what may we ascribe the "body," or viscosity of a good chocolate coating?
4. To what peculiarity of cocoa butter do we owe our ability to dip chocolate?
5. What percentage of the total importations of cocoa beans is annually refused admission to the United States?
6. How does a late bloom tend to affect the world almond crop?
7. Which of the almond regions has produced in a normal year as much as one-half of the total average world crop of 80,000 tons?
8. How do you account for the fact that an occasional bitter almond is sometimes found among almonds which are ordinarily all sweet?
9. What is "shell" butter?
10. What is the "expeller" process?

(The answers to the above questions will be found on Page 59 of this issue.)

Liquid Raw Sugar by Boat

For what is believed to be the first time in the history of the sugar industry, a boat load of liquid raw sugar pulled up at the Brooklyn dock of Refined Syrups, Inc. The usual scene of scurrying dockmen was replaced by the more orderly process of pumping the sugar from the hold of the vessel directly into the company's storage tanks. The transforming of this liquid raw sugar into "white syrup" without the usual intermediate stages of crystallization, re-crystallization, granulation and screening, strikes at the roots of one of the oldest traditions of cane sugar manufacture. "Cane sugar via tank wagon and pipe line" may yet become the slogan of the cane sugar industry.

Mr. John C. O'Brien of the Joseph Burnett Company, Boston, has been advanced to the position of manager in charge of bulk sales. As a result of last year's unusual increase in the sales of Burnett's extracts, spices and color pastes, his entire time will be devoted to this phase of the business. Mr. O'Brien has been associated with the Burnett Company for the past twenty years.

The Lure of Engineering

W. E. Lowell, Air Conditioning Engineer, who has been with Heit-Miller-Lau Company for the past eight months, is now associated with the York Ice Machinery Corporation.

Harold Stetzer With Peter's

The appointment of Harold H. Stetzer as special representative, has just been announced by Lamon Corliss & Company, New York City, agents for Peter Cailler Kohler Swiss Chocolate Company.

Mr. Stetzer was formerly with Van Houten, Inc. He has had long experience in selling Dutch type cocoa powders and in the ice cream trade.

A Day with the Almond Gr

The first of a vivid and instructive series on foreign and domestic nut meats

Above—A roadside patriarch of Bari's almond groves. Right—White and pink, peach-like and flat-petalled—a branch of a flowering almond tree in Bari, Italy.

NO ONE knows exactly the original home of the almond tree. Presumably it is a native, like so many of its nearer and more distant relatives, of southwestern Asia: Persia, Mesopotamia, possibly Syria, in all of which countries it is still cultivated extensively, chiefly for home consumption of its delicious fruits. Historically it makes its first appearance in Greece about the sixth century B. C.; Greek seafarers and colonists were certainly responsible for its transplantation to Italy—especially Sicily—about the first century B. C. Almonds are one of the oldest articles of food, a luxury rather than a necessity, but keenly sought after and appreciated for well over two thousand years.

Botanically the almond is very closely related to the peach, which is much more universally known and grown. Even experts have difficulty in telling the two trees apart except when fully clothed with leaves and young fruit. Prune trees and apricot trees belong to the same botanical family; in fact, sweet apricot kernels resemble sweet almonds in taste, appearance, and nutritious value, just as bitter peach and apricot kernels resemble the bitter almond kernels. In some European countries, and in China, where the pure food laws are less stringent than in the United States, the kernels of the sister trees are used almost interchangeably with almonds.

Photos courtesy Habicht, Braun & Co.

The Bitter with the Sweet

The almond trees attain a height of twenty to thirty feet when mature; the tree begins to bear when about seven years old, reaching its maximum bearing capacity at ten to twelve years, and continuing to bear commercially for a great many years. The trees are propagated by budding or by seedling from bitter almond stocks; trees produced by the latter method require subsequent grafting with sweet almond trees. If this is not properly done, the same tree may produce bitter and sweet almonds at the same time. This is one of the reasons why an occasional very rare bitter almond is found even among almonds that are ordinarily all sweet.

The trees blossom before the leaves begin to sprout, from some

thethe dGrowers

By
HERMAN R. HABICHT

time in January to early March, depending upon the climatic and geographical conditions and the variety of tree. The flowers are very lovely —white and pink, peach-like and flat-petalled; an almond orchard in full bloom is a fairylike sight. The early blooming makes the almond trees particularly susceptible to frost; the delicate flowers and very young fruits can suffer severely from temperatures just under freezing. Progressive farmers, chiefly in California, overcome this danger to some extent by smudging.

Early Blooms Mean Small Crops

A late bloom, caused by cold weather during January and February, greatly reduces the danger from frost and increases the probability of a large crop; early blooms generally make for smaller crops. The lack of immunity against even slight frosts and the early blooming habit make almond tree cultivation a very risky enterprise; these are the principal factors responsible for the great quantitative variations in the crop from year to year.

The ripe almonds are harvested from July until September, depending again upon the variety and the geographical and climatic conditions in the region of production. The first Moroccan almonds normally reach the London market early in August, and the first Jordan almonds have arrived in New York before the middle of August. In a normal year the bulk of the crops are brought to market in the producing countries from the end of August to the beginning of September, but the almonds grown in northern Spain and southern France are rarely ready for shipment before the early days of October.

The two principal kinds of almonds produced commercially are the bitter and the sweet; the former largely in Morocco, to a lesser extent in the Bari section of Italy, in Sicily, in northern Spain and in the Provence; the latter much more widely on the shores of the entire Mediterranean, in Persia, India, China, California, Australia and South Africa. There are said to be well bearing almond trees in the North Atlantic States, in Germany, and even in England, although the production outside of the subtropical climatic zones is of no commercial importance.

Mt. Aetna seen through the almond trees which fringe the Straits of Messina (Sicily).

From the point of view of the world trade in almonds, the princi-

An almond orchard in full bloom is a fairy-like sight. Note the absence of leaves on the blossom-laden trees.

pal foreign producing regions and the chief shipping towns, in the order of quantitative importance, are: The Puglie district in southeastern Italy, with Bari as export center; Sicily, whose main almond ports are Catania, Syracuse, Palermo, and Messina; Mayorca, with Palma de Mayorca; the Spanish provinces of Alicante, Murcia, and Valencia, with the ports of Alicante and Valencia, an Malaga and Almeria, with Malaga; northern Spain, with Tarragona; Morocco, with Mogador; the Provence, in France, with Marseilles; and of much lesser importance Portugal, the Canary Islands, Greece, Syria, Persia, Tunis, Algeria.

Bari Controls Price

From a price determining point of view, the section controlled by Bari is by far the most important since in a normal year this region has produced about one half of the total average world crop of about eighty thousand tons of shelled almonds. From the American buyer's and consumer's point of view, Bari almonds are relatively unimportant, since the bulk of them are so-called ordinary almonds consumed in large quantities by the almond paste and marzipan manufacturers of northern Europe, principally Germany and England. On the whole, the Bari market has not enjoyed a very enviable reputation, especially in America, so that many of the Bari almonds that come to this country are brought from Sicily, where there are a number of exceedingly aggressive and progressive exporters, who know how to select, pick and grade their merchandise to satisfy the exacting requirements of the American market.

Normally, i. e., when the Sicilian crop is reasonably good and prices there are such as to compete readily with the chief corresponding grades produced in Spain and elsewhere, Sicily furnishes the United States with about half of its requirements of imported almonds, although the total quantity is decreasing owing to the competition of California, which produces grades of almonds that compete largely with the bulk of the varieties constituting a large part of our purchases in Sicily. Of the remainder of our imports, Spain supplies us the larger share, to an increasing extent with almonds of special types, grades, shapes and sizes, specially selected, machine- and hand-picked, for the many different uses to which shelled almonds are put in this country.

Why America Relies on Spain

The leading Spanish exporters have been familiar with the requirements of the American market for years; they appreciate the necessity of competing with the domestic growers to a greater extent than the shippers anywhere else, who have always been able to do a very satisfactory business involving much less labor and trouble and consequently less risk with northern Europe. Perhaps one of the reasons for America's greater reliance upon Spain as a supplier of almonds is that Spanish almonds really are all sweet, owing to the more careful cultivation of the trees, while even the best and most carefully selected Italian almonds may contain a bitter almond, due either to wilful mixing of the almonds in the shell coming from trees known to be bitter with the sweet, or occasionally to

(*Continued on page* 59)

A Sicilian almond grove. Almonds are distinctly visible on the tree in the foreground.

The manufacturer who splits hairs on the color and aroma of a lot of cocoa beans often buys his cocoa butter on the description "pure, prime cocoa butter." It may be "pure" and it may be "prime", but is that all?

Which IS *the* Best Method *of* Pressing Cocoa Butter?

By EDWARD BENYON

COCOA butter is without question *the* ingredient which makes chocolate. This statement may be questioned (it no doubt will be), but nevertheless the fact remains that the values of all the other ingredients depend upon it. The character of cocoa butter in the liquor or flavor part of the chocolate makes some difference in the ultimate out-turn, of course, but as the proportionate amount of such cocoa butter present is generally small, it can be disregarded for the purposes of this discussion. Generally speaking, it is the cocoa butter *added as such* which is of primary importance to the quality of the finished chocolate.

A poor cocoa butter, even though it possess a good flavor when fresh, will develop extremely objectionable flavors upon being subjected to the processes of manufacture and of aging, to the detriment of both the chocolate coating of the candy center on which it is used. Such a butter is invariably found to be composed of fatty compounds of the lower types which melt at low temperatures.

The majority of cocoa butter users would be highly indignant (and rightly so), if someone were to accuse them of demanding poor grades of cocoa butter, but since a large part of the cocoa butter manufactured today is of this type, and since most of it is bought purely on a price basis, they must be lamentably ignorant or careless. Think for a moment, before questioning this statement, how many of you buy cocoa butter by brand or are willing to pay a slight premium to obtain top quality. To most confectioners, cocoa butter is cocoa butter and the few who discriminate between different brands and qualities of cocoa butter are not sufficient to make the manufacture of an extremely high grade of cocoa butter worth while.

Numerous manufacturers will go to extremes in buying cocoa beans and vanillas; they will sort over lot after lot, split hairs on flavor and aroma, and pay practically any price to get what they want; in fact, they behave under these circumstances exactly as if they manufactured good products and intended to keep them so. When they buy butter, however, they will chase around for a week to get a low price; will buy without making any attempt to find out what kind of cocoa butter they are going to get, how it was made or from what it was made, so long as it is called "pure prime cocoa butter." They are more fussy with their coal.

Switch in Beans Influences Butter

Much of the fault for these conditions can undoubtedly be attributed to the enormous growth in the use of cocoa butter. The main source of cocoa butter supply has been the manufacture of cocoa powder. In the earlier days of the industry, and practically up until the World War, cocoa powders were made almost entirely from the better grades of cocoa beans, namely, Caracas, Arriba, etc. The cocoa butter so obtained retained much of the aroma and flavor of these beans and possessed the texture and hardness which made Van Houten's A, Cadbury and Walter Baker brands famous.

The tremendous war demand was greater than the respective growths of these fine beans could supply and so cheaper grades, with poor or bad aroma and soft fats, were substituted. Post-war deflation, the subsequent cut-throat competition, and the continued demand for cheaper and cheaper prices continued to force quality standards down to the present levels.

The raising of these levels is in the hands of the buyer. He can discriminate. He can demand higher qualities, and in so doing, make it desirable for cocoa butter manufacturers to return to the old pre-war standards.

While much of the poor quality of the present market cocoa butter is due to inferior raw materials, a large measure of responsibility can be placed on the methods of manufacture. Progress has been only in the direction of speedier and cheaper methods of production, very little thought being given to the improvement or even the retaining of good qualities. If it is not possible to make all cocoa butter of as high a

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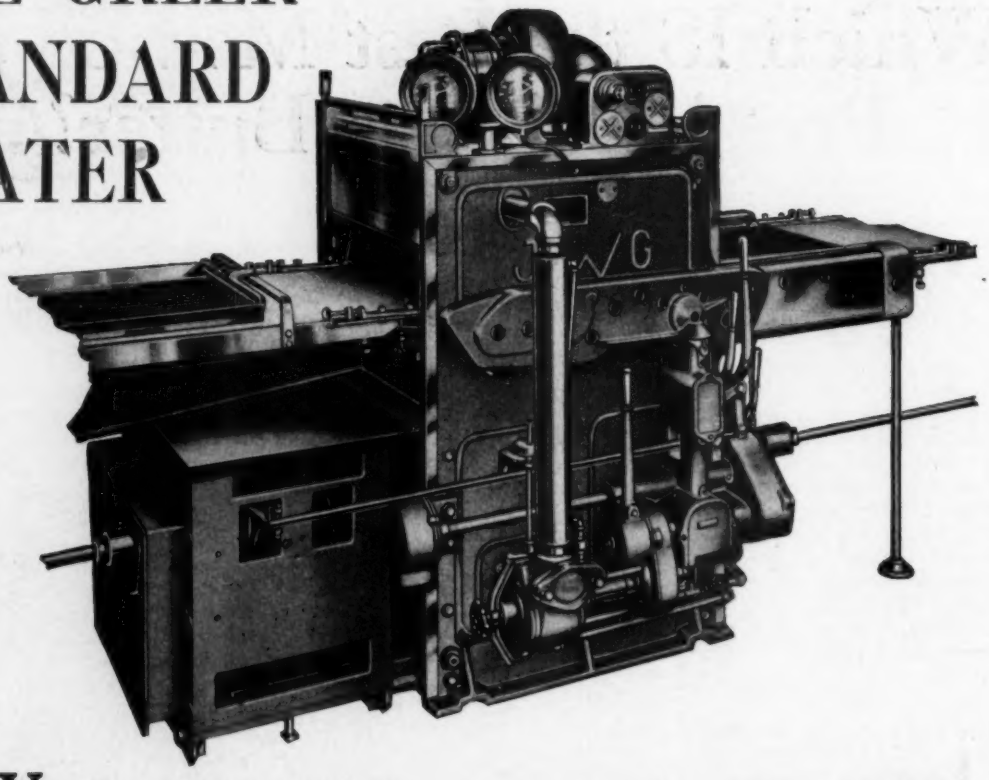

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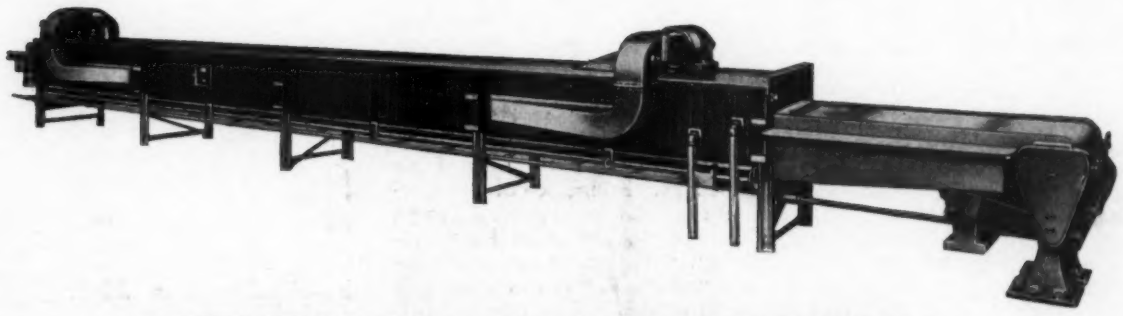

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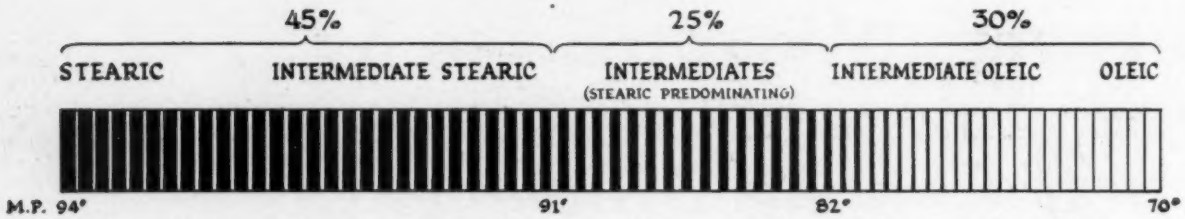
Good Butter



The better the butter, the greater the preponderance of hard fats. The better the beans, usually the better the butter. Which is why chocolate made from good beans resists spoilage better than chocolate made from the lower grades.

standard as, let us say, the old Van Houten A, it is at least possible to correct the present careless methods and get within sight of such a standard.

The time is rapidly coming when the cocoa butter industry will have to adopt methods of manufacture similar to those used in the oil industry. At present, however, no one seems to have the courage or foresight to make the necessary outlay for research and machinery. This attitude can be condoned only on the ground that there is no insistent demand for a standardized quality product. It is a shortsighted policy none-the-less.

Beans Determine Butter Quality

Methods of manufacture can work miracles at times but they measure up to and no higher, than the grades of raw material they must work with. In any discussion of methods of manufacture, this fact should be borne constantly in mind. One manufacturer will get good results out of a machine or method which another will throw out as useless but although some of the fault may lie in the workings of the machine or method, the chances are that it is due to the type or quality of material used.

Cocoa beans vary not only as to type, but also as growing, fermenting, drying and storage conditions vary; and as the beans vary, so does the cocoa butter which they contain. Fully-ripened beans, well fermented, dried and stored, give a higher grade of cocoa butter than unripe, poorly-fermented or mouldy beans of the same type. No method of manufacture can get a good grade of cocoa butter from bad cocoa beans, although some methods of manufacture undoubtedly do less damage to good material.

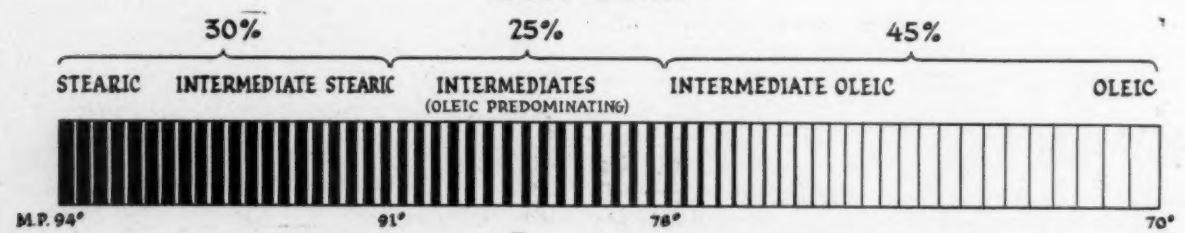
In order to thoroughly understand the reasons why one process of manufacture is superior to another, it would perhaps be well to look into the composition of cocoa butter and into the differences known to exist between cocoa butters extracted from different types of beans. Cocoa butter has a very complex structure. It is composed of the glycericides of a large number of fatty acids, the predominating varieties being Oleic (soft) and Stearic (hard). These fats vary in consistency all the way from hard fats to thin oils, and it is because of the great number of different compounds which come between these extremes, that cocoa butter possesses its characteristic quality of melting gradually—the softer fats going first, then the next higher and so on, giving the smooth, slightly chewy texture characteristic of good chocolate.

What Is the Ideal Butter?

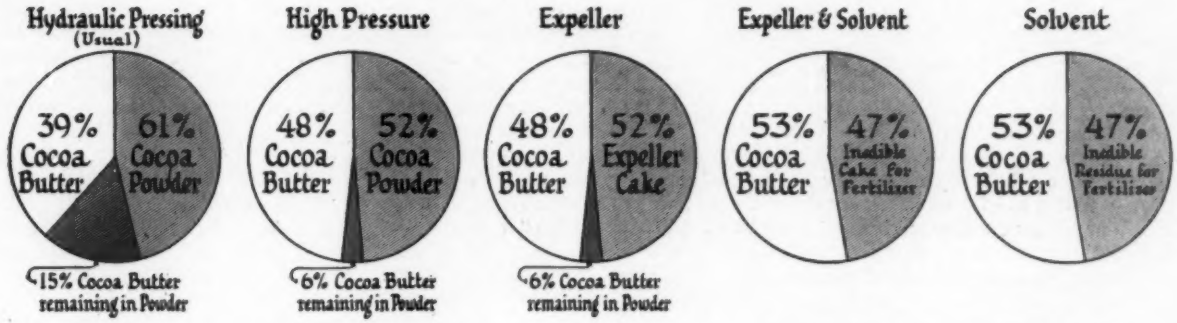
The ideal cocoa butter for chocolate has a clean flavor, a bright, clear color and, while it does not set up too fast, has a firm, hard texture. It will contain a good many of the fats which melt at the lower temperatures, but a larger percentage which melts around 94° F. The old type of cocoa butter, made from Arriba, Caracas, etc., possessed these characteristics, but as a general rule, the prevalent type of butter made from cheap and sometimes partly decayed beans, melts well below 90°, contains fewer intermediate products between the hard and soft fats, and as a result, dissolves practically in its entirety, at a single point on the temperature scale. However, some of these cheaper types of beans, if sufficiently ripened, and properly handled in manufacture, can be made to yield cocoa butter approximating the ideal.

The fatty constituents of cocoa butter can be roughly divided into two classes, termed saturated and unsaturated. There are many intermediary forms but since their predominate characteristics are akin to one or other of the two groups mentioned, this rough classification will suffice. The Stearic high molecular or hard types of fat are termed "saturated." They are very stable and resist chemical change. The

Poor Butter



Showing the breaking down process which has set in in a poor butter, leaving the low-melting fats in preponderance. Much butter of this type is sold for pure, prime cocoa butter.



Showing the disposition made of the fat and fiber portions of the cacao nib according to extraction process used.

cocoa butter which contains the highest percentage of this type of fat comes nearest to the ideal; it is harder, is much less likely to break down during the process of manufacture, or to go rancid. The Oleic low molecular and softer types, are termed "unsaturated." These constituents are extremely unstable. At the slightest chemical change they break down into their original components, fatty acids and glycerol, giving the signal for an endless line of reactions resulting in a myriad of new break-down products—all troublesome.

This tendency to chemical change is inherent in the fats of the cocoa beans most commonly in use for the manufacture of cocoa butter today and it is unfortunate that the prevalent methods of manufacture do not tend to retard this action but accelerate it instead, thereby producing a product already well advanced along the road to disintegration.

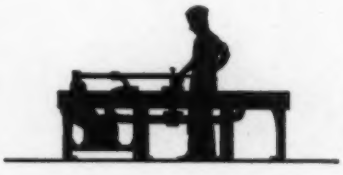
Hydraulic Pressing Holds Limelight

The original and best known method of extracting cocoa butter is by the pressing of liquor chocolate obtained by grinding roasted and shelled cocoa beans. This method has evolved gradually from the old hand screw press which gave a low yield of cocoa butter, to the modern high power hydraulic press which leaves very little cocoa butter remaining in the cake. The outstanding defect of the hydraulic method of pressing is that it subjects the product to extreme heat in all steps of the process, the heat being needed to break down the cell structure of the bean so that the cocoa butter can escape easily.

This extreme heat begins in the roaster where the beans are cooked until almost burned (in many cases, they are considerably burned). They have then lost the toughness of the raw bean and can be readily crumbled. The heat at this stage of the process is in the neighborhood of 600° F. It is sustained over a fairly long period. This roasting, by the way, enables unscrupulous manufacturers to use rotten beans, as the partial burning kills most of the odors by which such beans ordinarily makes themselves known.

After roasting, the beans are cooled, cracked and winnowed. The nibs resulting from this process are then ground. During the grinding process, the material is subjected to applied heat in addition to the normal heat of grinding. The thin oily liquor chocolate which results from this grinding is the raw material for the press. The presses, which are of several types, consist primarily of a series of pots with perforated false bottoms, to which the pressure is applied. Here again high heat is applied. This continual application of heat is the worst possible treatment which can be afforded to the cocoa mass.

Heat is one of the most potent of the chemical actions. Its influence is particularly disastrous during the roasting and milling process in view of the moisture which is present at this stage. This moisture, in the presence of excessive heat, accelerates the breaking down of the unsaturated fats.



Quality Cocoas Less Effected by Heat

The effects of roasting and prolonged heat on the higher types of beans (the Arribas, Caracas, etc.) are of a much less damaging nature than on the lower, cheaper types since the saturated, hard fats (those less subject to easy chemical change) are present in so much larger proportions in the former. The disintegration started in the roaster in this process of pressing, does not end with the manufacture of the butter (although it might remain dormant for a time if the butter were ever in the improbable condition of being free from moisture and away from light and air) but action and reaction continue through all of the subsequent steps of storage, transportation and use—in a degree varying with the extent to which the butter is exposed to heat, moisture, light and air.

The fact that there have been, and still, are, many excellent cocoa butters manufactured by the hydraulic process, may make the above statements appear entirely too sweeping but if the condemnation errs in either direction, it is probably in not being sweeping enough. The proof of this lies within easy sight every day. Try to obtain cocoa butter of a high standard in any quantity over a period of time. The task will be difficult. The majority of purchases will be well below standard, and much of it will be little more than extremely badly pressed and partially decayed vegetable fat hardly fit for soap making. If further proof is necessary, the fact that most of the cheap chocolate flooding the market is made with commercial cocoa butter should be proof enough. The troubles the manufacturer experiences with coatings are almost invariably with the

cheap kinds, and very rarely with the high grade ones.

The original purpose of cocoa butter pressing was to obtain a product (cocoa powder) of a lower fat content than cocoa beans or nibs. Cocoa butter was a by-product. Chocolate candy was evolved in order to find a use for it. This is still to a great extent true, although in recent years the enormous increase in the consumption of chocolate has raised cocoa butter from the status of a by-product to that of a primary product of equal or greater rank than cocoa powder. The care which a manufacturer gives to the making of cocoa butter will depend to a large extent upon which he considers his primary product.

Post-Treatment of Pressed Butter Will Help

This process will undoubtedly always be with us. Cocoa powder demand will see to that, if nothing else does. But it has got to be improved. The speed with which such an improvement takes place will depend wholly upon the demand for a better product and since the user of cocoa butter is the one who furnishes this demand, it is entirely up to him.

While this improvement will lie to some extent in increased knowledge of what takes place during the present process, it will result even more from the adoption of methods which have been in use in the oil industry for many years. It is obvious that it will be necessary to process the butter after it is pressed in order to remove the objectionable by-products which the process develops.

The so-called "expeller" process of pressing has only recently been adapted to the manufacture of cocoa butter, although it has been used in the extracting of other fats for a number of years. It, too, has its disadvantages; but it also has merits which are fast gaining for it a permanent place in the industry.

A certain amount of prejudice greeted its introduction and much remains to this day—an attitude which is incomprehensive in the light of the fact that it gives the user cocoa butter at a lower average price and provides the butter presser with an alternative process which can be used when the manufacture of cocoa powder is unprofitable.

The expeller process, as developed so far, uses only raw, that is to say, unroasted cocoa beans. It has not been possible to use roasted beans because of their brittle nature. However, it is very efficient in extracting fats from sweepings and other refuse containing a high percentage of shell, although the amount of butter to be obtained from this last source is extremely small and can be disregarded. In speaking of expeller butter, it is understood that only that obtained from the raw beans is referred to.

Prolonged Heat Avoided in Expeller Process

Heat is used in the expeller process only to the degree necessary to thoroughly warm the material. It is not sufficient to cook it to any degree. A high heat is generated during the last part of the process but its duration is momentary and does no damage. The process consists roughly of two worms running the length of a slotted barrel. One end of this barrel is closed by an adjustable plate. The first worm feeds warmed and broken cocoa beans to the other, which in turn forces them through the space between the plate and the barrel; as this space is small, a tremendous pressure is generated which presses out the butter.

The advantage of a process which does away with the prolonged subjection of the mass to intense heat is self-evident; but a further advantage of still greater merit is inherent in the process, namely, its *inability*, to use defective cocoa beans. There is no roasting process to burn up the superficial characteristics of such beans, consequently, clean-smelling expeller butter cannot have any of the camouflaged defects which are contained in so much of the pressed type.

As the process is comparatively new to the industry, it is only natural that there should be a great amount of ignorance concerning it. Unfortunately even many of the present users still share that ignorance, one result of which has been the turning out of poor expeller butters. Some of these expeller butters have been terrible—a fact which has seriously militated against the adoption of the process generally. It seems inevitable that the good must suffer with the bad.

It has been proved beyond doubt that expeller butter, when properly made, has a higher melting point than butter produced by the hydraulic method from the same beans. The characteristics of cocoa butter obtained by this process from the cheaper beans closely approach those of butter made from the higher grade beans by the hydraulic process.

In common, with all natural fats, expeller butters contain free fatty acids and other products of change in their make-up, but in no such proportion or of such a pronounced type as have the overroasted bean butters. Keeping qualities are excellent. Flavor, although different from that produced from roasted beans, is the same bland flavor from lot to lot; in fact, there is less chance of spoiling the basic bean flavor of the chocolate with this butter than was formerly the case.

Expeller Demands Good Material to Work With

As has been pointed out before, this process must have good beans to work with if it is to produce a product that even the least discriminating user would accept. Also, the butter presser must have some idea of the method of manufacture beyond which end of the machine to put the beans in. The reason for this is that since the beans are unroasted, most of the moisture and some of the volatile oils and flavors which are ordinarily burnt up, come over with the butter. If these are not evaporated, the results are similar to what might be expected to occur with other types on further manufacturing. The extraction of these substances is effected by evaporation and is very simple, but the neglect of this necessary part of the process and the use of defective beans have undoubtedly held back general acceptance of the process.

However, the potentialities of the expeller method are so great that a general acknowledgment of its worth, must inevitably come. A process which will give a cocoa but-

(*Continued on page* 58)

No other confection has tied in with the menu to better advantage than the marshmallow. With the coming of dextrose, it takes its long sought place on the diet menu—mute evidence that the candy industry is not standing still.

Number Three in the M. C. "Pioneer" Series on Refined Dextrose—the Candy Industry's Newest Tool

By JOHN M. KRNO, *Chemical Engineer*

with

ADOLPH SCHILDTBERGER, *Practical Candymaker, Collaborating*

Dextrose—as a Marshmallow Ingredient

Not since science wrested the white crystals of ordinary sugar from the sugar cane has the candy man witnessed so fundamental a change in his primary materials. The coming of dextrose has opened the way to long sought medical and dietetic recognition. Doctors recognize dextrose as the normal fuel which powers the human engine. Many prescribe it as a diet sugar. The candies which form the basis for the effective slenderizing regime of Drs. Gordon and von Stanley are made with the refined dextrose which is the subject of this article. —The Editor.

ONE of the first uses the candy industry put dextrose or corn sugar to, when it was first introduced commercially, was in making marshmallows. The writer does not believe that this was done because it was considered the easiest field for dextrose. On the contrary, it has proved to be a fairly difficult one, as has been attested by the troubles run into by these venturesome pioneers. The field promised, however, to be a fruitful one in which to start an investigation of the uses of dextrose in the candy industry.

What were the reports of those who tried the sugar? That the marshmallows grained, became hard and tough, and lacked resiliency. That marshmallows made with dextrose had a short shelf life and that they discolored very quickly. The chocolate fell off a couple of weeks after coating. They puffed up and burst. In fact, generally speaking, marshmallows made with dextrose or corn sugar gave rise to all the troubles that have ever been met with by the candy maker in the making of this confection. The refiner was left with but one ray of hope. The troubles encountered in confectionery factories were so many, so varied and at times so contradictory, that it became evident that they must be due to mishandling resulting from a lack of understanding of the sugar's characteristics as well as to the psychological drawback of working with a brand new product.

It was only natural to regard some of the physical characteristics of this newest tool of the candy maker as drawbacks to the production of a good, long-lifed marshmallow. What was the significance of its much lower solubility? The temperature coefficient of solubility was materially higher than that of cane sugar. If the candymaker overlooked this, could it not give rise to trouble? Was the comparatively lower viscosity of its solutions a critical factor in the making of marshmallows? On the other hand, the fact that could not, with two sugars present (dextrose and sucrose) the total solubility was increased, be utilized to advantage? These and a host of similar questions arose to plague the early investigator. The answers to these questions were to determine whether dextrose had a rightful place in the marshmallow industry.

If dextrose was to be used to ad-

Chewey or Short?

One of the marshmallow manufacturer's most difficult problems is control of texture. Proper proportioning of sucrose to dextrose in mixed sugar batches is seen as an effective means of lengthening shelf life and stabilizing texture.

vantage in marshmallows, it was evident that the chocolate-covered variety offered the greatest chance for success. Practically all the confectioners who attempted to use dextrose in marshmallows during the early days following its introduction tried their hand at the chocolate-covered article. For similar reasons our own efforts were first directed to this type of confection.

Criteria of Proposed Formulas

In order to judge fairly and accurately the value of dextrose for this work, the following criteria were set up and the effect of the use of dextrose on each carefully noted.

A—Texture of the marshmallow.
B—Appearance.
C—Taste.
D—Shelf life.
E—Yield.
F—Adaptability to accepted factory procedure.

It is impossible to define accurately what each candy maker means by the term "good texture." Their standards differ widely. Some prefer a fairly "short" marshmallow. Others like to have a little "stringiness" to the consistency. Extreme shortness is not wanted in any case, since it is commonly regarded as a warning sign of possible crystallization and hence hardening.

Resiliency, which is to say, the ability of the marshmallow to regain its former shape after distortion, is another attribute of texture. The crust of the marshmallow is also considered under this heading.

From the standpoint of an undipped marshmallow, the crust is all important. It is somewhat less important, however, in making a dipped piece. The protection offered by the chocolate covering against evaporation is undoubtedly more complete than that given by the fine crystalline sugar film of the marshmallow proper. Yet if the crust of the piece to be coated is not strong enough, or is too hygroscopic, trouble will be experienced in dipping and subsequently a peeling off of the chocolate may ensue. Therefore the character of the crust must be given due consideration even

Resiliency

The ability of a marshmallow to regain its original shape after deformation is another criterion of texture which helps determine the consumer's satisfaction or lack of satisfaction with the piece.

where the pieces are to be chocolate-dipped.

The effect of the use of a new ingredient on the color of the marshmallow must be considered. Except in colored goods, this color must be pure white without any suggestion of dullness.

In judging the taste of the new product one must consider the effect of the dextrose both on the sweetness and on the flavor. Such judgment is necessarily individual.

Importance of Shelf-Life

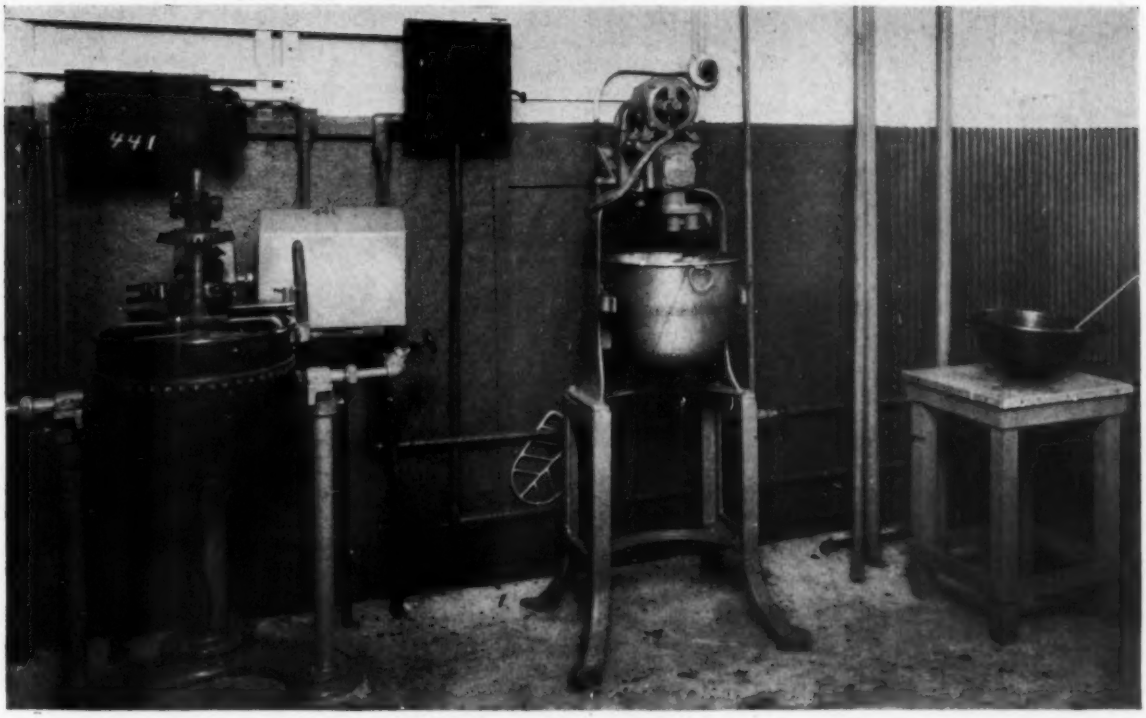
A marshmallow may be made that will pass with high honors on all three of the quality points enumerated above which it is comparatively fresh. This would be sufficient for a judgment in its favor if the product were to be consumed immediately. However, marshmallows must stand up from three to six months at times before being consumed. What will its texture be then? Will it have dried out? Will it have hardened owing to the sugars slowly crystallizing? Will it go off color? Is it likely to ferment? These questions define the keeping qualities or "shelf life" of the confection.

Naturally after the confectioner has satisfied himself that the new product will not impair the quality of his confection, he becomes concerned about the yield. Is the number of pieces obtained from a batch more, equal to, or less than that obtained from his regular formula?

Last, but by far not least, he must know whether the new formula will fit into his present mode of manufacture. Suppose the marshmallow made with dextrose satisfied him on all the questions previously raised. If it requires special handling or equipment of a nature to slow up production or add to his production costs, he may rightly balk at using the new raw material in his batch. This factor might conceivably outweigh all the other good qualities which the new sugar might impart to his product. This attitude does not preclude the introduction of any change whatsoever in the standard mode of manufacture. A reasonable difference in the process is usually acceptable provided the

How About Crust?

Even where the marshmallows are to be used for dipping, the character of the crust is all important. If it is not strong enough, or if it is too hygroscopic, trouble will be experienced in dipping and a peeling off of the chocolate may ensue.



A section of the Dextrose candy experiment plant maintained at Edgewater, N. J., by the Corn Products Refining Company. The plant is supervised by Mr. Adolph Schildtberger, a candy superintendent of international reputation.

merits of the product appear to warrant it.

The candy laboratory which has been doing the preliminary experimental work on dextrose marshmallows made a great number of trials in order to develop a formula for a chocolate-covered marshmallow that would satisfy all of the requirements for a good standard confection of that type.

No one is interested in the failures. Some of the formulas tried gave trouble owing to the tendency of the sugars to crystallize. Others gave marshmallows which resulted in the familiar "peeling off" after standing around for two to three weeks. But from every failure a lesson was learned.

Efforts Crowned with Success

Suppose we pass over the failures and jump in our minds to the formulas that have stood the tests of time and large scale manufacture. The following will yield a marshmallow capable of standing up satisfactorily for at least five to six months:

Chocolate-Covered Dextrose—Marshmallow (Formula A)

40 lbs. Dextrose (Commercial Cerelose was used in the experiments).
25 lbs. Cane sugar.
100 lbs. Corn syrup (43 Bé.).
4½ lbs. Gelatine.
12½ lbs. Nougat cream.
10 ozs. Glycerine.
8 ozs. Vanilla extract.

Fifty pounds of the corn syrup, all of the dextrose and cane sugar, to which is added just enough water to bring about complete solution, are cooked in a steam-jacketed kettle to 230° F. This mass is then deposited into the remaining corn syrup, the temperature of the mixture being somewhat reduced.

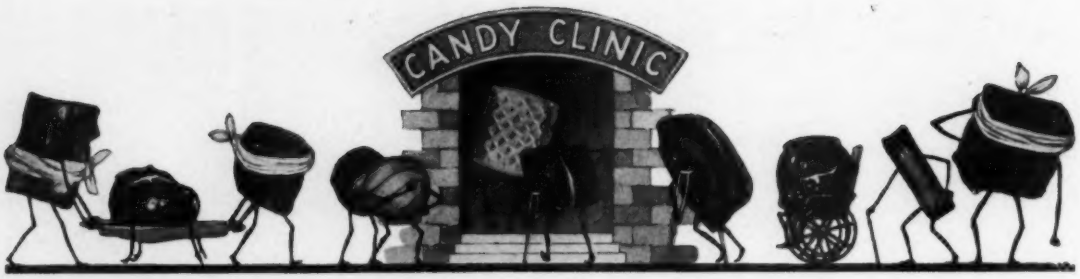
The gelatine is soaked in sufficient lukewarm water to make it appear as a gel within thirty minutes. The sugar-syrup mixture is poured into a standard make of beater and stirred thoroughly for a brief period. The gelatine gel is added gradually during this slow beating. After all the gelatine has been mixed in, the beating is made more rapid until the full speed of the machine is attained. The nougat cream and glycerine are added during the interval in which the speed of beating is being increased. The vanilla extract is added toward the end of the beating operation.

The beaten mass is thinned to the desired consistency with a warm 30 Bé. sugar syrup. This is done so that the mass will have sufficient flow for the depositing machine. This sugar syrup can consist of a 50-50 mixture of cane sugar and dextrose, or of all cane sugar, or of all dextrose. Under ordinary conditions no great amount of thinning is required.

The nougat cream used in connection with this formula was made as follows:

Thirty-six pounds of 43 Bé. corn syrup and 14 pounds of Dextrose were dissolved in sufficient water to bring about solution, and cooked to 236° F. over an open fire. Twelve ounces of egg albumen were dissolved in two quarts of water and whipped stiff. The cooked syrup was then whipped gradually into the egg albumen.

The above marshmallow is of excellent quality, entirely suitable as a filling for the larger pieces that are usually sold during the holiday seasons, moulds such as Santa Claus, rabbits, chicks and eggs. It is admirably adapted to use as a center in assorted chocolates or in a box of flavored marshmallows straight-packed.



The Candy Clinic is conducted by one of the most experienced superintendents in the candy industry. Each month he picks up at random a number of samples of representative candies. This month it is solid chocolate bars and moulded goods; next month it will be dollar chocolates. Each sample represents a bona-fide purchase in the retail market, so that any one of these samples may be yours.

This series of frank criticisms on well-known, branded candies, together with the practical "prescriptions" of our clinical expert, are exclusive features of the M. C.

Solid Chocolate Bars *and* Moulded Goods

Code 2A 30

Milk Chocolate Bar—1⅜ Ozs., 5c

(Purchased in a cigar store, Boston, Mass.)

Appearance of Package: Good.
Wrapper: Brown, name in silver. Inside wrapper of silver foil.
Color: Good.
Gloss: Good.
Texture: A little dry.
Taste: Fair.
Moulding: Good.

Remarks: This is a large bar for the money. However, the chocolate is not quite as good as that to be found in smaller bars of the same price.

Code 2B 30

Almond Milk Chocolate Bar—1¼ Ozs., 5c

(Purchased at a news stand, Boston, Mass.)

Appearance of Package: Good.
Wrapper: Brown, name printed in silver.
Color: Good.
Gloss: Good.
Texture: A little dry.
Taste: Fair.
Almonds: 6½, fair size, well roasted almonds.
Moulding: Good.

Remarks: This bar is well worth 5c. More almonds are used in making it than in any other 5c almond bar examined.

Code 2C 30

Chocolate Bar, 1¼ Ozs., 5c

(Purchased in a cigar store, Boston, Mass.)

Appearance of Package: Good.
Wrapper: Yellow paper band, printed in brown. Inside wrapper of silver foil.
Color: Good.
Gloss: Good.
Texture: Good.
Flavor: Coffee; very good.
Moulding: Very good.

Remarks: This is an excellent eating bar for those who like coffee flavored chocolate.

Code 2D 30

Sweet Chocolate Bar—2⅔ Ozs., 10c

(Purchased from a newsstand, Boston, Mass.)

Appearance of Package: Good. A little different from the everyday bar.
Color: Good.
Gloss: Good.
Texture: A little dry.
Taste: Fair.
Moulding: Good.

Remarks: This bar of chocolate has a texture and taste that is different from most bars. It is a trifle too sweet. Cannot quite compare with other good bars being sold at a similar price.

Code 2E 30

Sweet Milk Chocolate Almond Bar —1 Oz., 5c

(Purchased at a hotel news stand, Boston, Mass.)
Appearance of Package: Fair.
Wrapper: White glassine printed in blue. Silver foil wrapped on inside.
Color: Good.
Gloss: Good.
Texture: Good.
Almonds: 3 small almonds, well roasted.
Taste: Good.
Moulding: Good.

Remarks: A good eating chocolate. Suggest a few more almonds be used.

Code 2F 30

Sweet Milk Chocolate Bar—2¼ Ozs., 10c

(Purchased in hotel lobby in New York, N. Y.)
Appearance of Package: Fair.
Wrapper: White glassine, name printed in large, red letters. Silver foil wrapped on inside.
Color: Good.
Gloss: Good.
Texture: Good. Well finished.
Taste: Good.
Moulding: Good.

Remarks: This is a good milk chocolate bar. A more transparent outer wrapper might be used to permit the red lettering to stand out against the silver foil background with greater contrast.

Code 2G 30

Sweet Milk Chocolate—1⅛ Ozs., 5c

(Purchased in a retail store, Boston, Mass.)

Appearance of Package: Good.
Wrapper: Dark brown and gold. Name in brown and gold. Silver foil used for inside wrapper.
Gloss: Very good.
Color: Good.
Texture: Good.
Taste: Good.
Moulding: Good.

Remarks: This is a good eating milk chocolate for the price and a neat and practical package.

Code 2H 30

Milk Chocolate Almond Bar—1 Oz., 5c

(Purchased in a Woolworth 5 and 10 Cent Store, Chicago, Ill.)

Appearance of Package: Good.
Wrapper: Brown, name printed in gold. Silver foil used for inside wrapper.
Color: Good.
Gloss: Fair.
Texture: Pasty.
Taste: Fair.
Almonds: 6 small roasted almonds.
Moulding: Good.

Remarks: This bar at 5c seems a trifle high priced. It is not quite up to the standard of other goods selling for the same amount.

Code 2I 30

Milk Chocolate Almond Bar—2 Ozs., 10c

(Purchased in The Fair, Chicago, Ill.)
Appearance of Package: Good.

Wrapper: Brown, name printed in gold. Silver foil used for inside wrapper.
Color: Good.
Gloss: Good.
Texture: Good.
Taste: Fair.
Almonds: 21 small almonds, well roasted.
Moulding: Good.

Remarks: More almonds in this bar than any other at this price.

Code 2J 30

Sweet Chocolate Bar—2 Ozs., 10c

(Purchased in a high class restaurant, Boston, Mass.)

Appearance of Package: Attractive.
Wrapper: Cream color, name printed in gold. Silver foil used for inside wrapper.
Color: Good.
Gloss: Good.
Texture: Very good.
Taste: Good.
Moulding: Good.

Remarks: This is a very fine eating chocolate and well worth the money.

Code 2K 30

Milk Chocolate Almond Bar—1 Oz., 5c

(Purchased at the Boston Store, Chicago, Ill.)

Appearance of Package: Good.
Wrapper: Dark brown, name printed in gold. Silver foil used for inside wrapper.
Color: Good.
Gloss: Good.
Texture: Good.
Taste: Good.
Almonds: 6 small almonds, well roasted.
Moulding: Good.

Remarks: A little better value might be given for the money.

Code 2L 30

Milk Chocolate Peanut Bar—1¾ Ozs., 5c

(Purchased in a cigar store, Boston, Mass.)

Appearance of Package: Cheap looking.
Wrapper: Bright yellow, name in red and blue. Glassine wrapper used inside.
Color: Good.
Gloss: Hardly any.
Texture: Fair. A little dry.
Taste: The flavor of the peanuts dominated the chocolate flavor.
Peanuts: Spanish, well roasted.
Moulding: Fair.

Remarks: This bar, while fair value for the money, looks cheap.

Gathered from Counter and Stand

Is *your* bar here?

Are Your Bars and Moulded Goods Up to Par?

—an occasional glance around you at what the other fellow is doing will broaden your perspective and help you to originate new ideas of your own.

—The Candy Clinic simplifies the task by searching the highways and byways of the candy mart for you. Alertness is the price of progress.

Code 2M 30

Milk Chocolate Bars with Almonds —2 Ozs., 10c

(Purchased in a high class restaurant, Boston, Mass.)
Appearance of Package: New, attractive and different.
Wrapper: White Cellophane, name and border printed in yellow.
Color: Good.
Gloss: Good.
Texture: Too soft.
Taste: Good.
Almonds: 10 small almonds, well roasted.
Moulding: Good.
Remarks: This bar at 10c for 2 ozs. is a little high priced. The wrapper is very striking and is a departure from the usual chocolate bar wrapper.

Code 2N 30

Milk Chocolate Bar—2¼ Ozs., 10c

(Purchased in a chain drug store, Boston, Mass.)
Appearance of Package: Very pleasing and different.
Wrapper: White. Name printed in green and red. Silver foil used for inside wrapper.
Color: Good.
Gloss: Good.
Texture: Very good.
Taste: Good.
Moulding: Good.
Remarks: This is a very fine milk chocolate bar.

Code 2O 30

Chocolate Fruit and Nut Bar—5 Ozs., 10c

(Purchased in a chain drug store, Boston, Mass.)
Appearance of Package: Good.
Wrapper: Brown, name printed in gold. Silver foil used for inside wrapper.
Color: Good.
Gloss: Good:
Texture: Good.
Taste: Fair.
Fruit: Small raisins.
Nuts: Peanuts, well roasted.
Moulding: Good.
Remarks: What more can one expect for 10c?

Code 2P 30

Round Discs of Chocolate, 8 pieces—10c

(Purchased in Emporium Store, San Francisco, Cal.)
Appearance of Package: Good. Eight chocolate discs, each wrapped in red foil and tied together with red ribbonzene.
Chocolate: Sweet.
Color: Good.
Gloss: Good.
Texture: Good.
Taste: As if burnt.
Moulding: Good.
Remarks: This is a neat looking package. The chocolate, however, did not taste particularly good.

Code 2Q 30

Chocolate Dominoes, 4—10c. No weight

(Purchased in Emporium Store, San Francisco, Cal.)
Appearance of Package: Fair.
Wrapper: Brown, each tablet in silver foil.
Chocolate: Milk.
Color: Good.
Gloss: Good.
Taste: Fair.
Texture: Pasty.
Moulding: Good.
Remarks: The wrapper was printed "Chocolate Dominoes," but the tablets were plain moulded rectangles.

Code 2R 30

Milk Chocolate Fish, 3 pieces—10c

(Purchased in Emporium Store, San Francisco, Cal.)
Wrapper: White Cellophane.
Color: Good.
Gloss: Fair.
Taste: Fair.
Texture: Pasty.
Moulding: Good.
Remarks: Chocolate not up to standard.

Code 2S 30

Solid Chocolate Animals, 6 pieces —10c

(Purchased in a retail store, San Francisco, Cal.)
Appearance of Package: Good. Six chocolate animals, each wrapped in a colored foil, tied with green ribbonzene.
Chocolate: Sweet.
Color: Good.
Gloss: Fair.
Taste: Fair.
Texture: Too dry.
Moulding: Good.
Remarks: This should be a popular chocolate novelty at 10c.

Code 2T 30

Milk Chocolate Bar with Raisins, 1¼ Ozs.—5c

(Purchased in a department store, San Francisco, Cal.)
Appearance of Package: Fair.
Wrapper: Cheap looking. Cream colored wrapper; printing in white and red.
Color: Good.
Gloss: Good.
Taste: Fair.
Texture: A little dry.
Moulding: Good.
Remarks: Not a good tasting bar. Raisins had an off taste as though they had been burned.

Code 2U 30

Sweet Milk Chocolate Bar, 1⅓ Ozs.—5c

(Purchased in a department store, San Francisco, Cal.)
Appearance of Package: Good.
Wrapper: Red with gold printing. Waxed paper used for inside wrapper.
Color: Good.
Gloss: Good.
Taste: Fair.
Texture: Good.
Moulding: Good.
Remarks: Sub-standard.

Code 2V 30

Milk Chocolate Hollow Dog—20c each

(Purchased in retail store, San Francisco, Cal.)
Appearance of Dog: Good. Face finished with white icing.
Color: Too light.
Gloss: Fair.
Taste: Fair.
Texture: Dry.
Moulding: Good.
Remarks: At 20c, a better grade of chocolate could be used.

Code 2W 30

Milk Chocolate Bar—5c

(Purchased at a news stand, San Francisco, Cal.)
Appearance of Bar: Bad. No wrapper used, bar chipped and scratched.
Color: Fair.
Gloss: Hardly any.
Taste: Fair.
Texture: Good.
Moulding: Good.
Remarks: No weight was indicated. We would hardly call this an acceptable bar for sophisticated purchasers.

Eric Lehman gives moulded goods market the "once over" and decides that

Solid Bars Need New Clothes

MACHINERY for turning out moulded bar goods has undergone material improvement during the past few years. With these machines and the assurance of a fair-sized production, the solid bar business is open to any manufacturer who makes his own coatings.

One machine in particular, does everything but wrap the bar. It is completely automatic, requiring the services of only one man to handle the entire process except wrapping. About all this man has to do is to check up on the weights, which seldom vary one way or the other. Weight, gloss and moulding are as near perfect as anybody would want them.

Marked Improvement Shown.

The bars examined in this month's Clinic were distinctly superior to those which we examined a year ago. Of course, we still come across bars which are still a far cry from what we could call good eating bars. But encouraging progress has been made.

In considering quality, we must consider the weight given for the price asked. This weight was in most instances ample, although in one or two cases where the price was high, the quality of the chocolate was by no means proportionately so. A few houses are turning out what I consider good eating bars at ten cents for two ounces. Of course, I realize that tastes differ and that it is hard to get any group of people together who will agree fully upon what constitutes good eating quality in a bar. I have had the experience of preparing what I thought was an excellent piece of milk chocolate, only to have some say that it was too sweet, while others said it was not sweet enough, too light in color, too pasty or too dry. It is very much a matter of individual preference, certainly, as regards milk chocolate.

When it comes to the sweet chocolate bars, there are, of course, many excellent ones on the market; also some that are not so fine. 10c for 2 ozs. is equivalent to 80c a pound—and the public has a right to expect something for their money when they pay 80c a pound. Mr. and Mrs. Candy-eater are becoming increasingly "fussy" in their eating habits and the poorly-flavored, coarsely milled and crudely moulded piece which went over with them twenty years ago hasn't a chance today.

New Wraps Needed.

One of the crying needs of the solid bar business is new clothes. While the specialty bars have been jazzing up the stands with sparkle and eye-arresting color, we find most of the old line solid bar goods houses still using the staid, unattractive brown wrap with some kind of silver or gold lettering.

Individualism rides rampant in the specialty market. Peters came out with a "chocolate-and-gold" which was striking and unusual before the war; and the rest of the solid bar goods business seems to have been "cribbing" on it ever since. We vary the monotony by changing our suits once in a while. Why not give the solid bars a chance to stand out from the mob?

Moulded Easter Goods.

We are in the midst of the Easter moulding season. Last year at this time, the Clinic examined such moulded goods as we were able to lay our hands on and found that breakage in some instances ran as high as 40 percent. Hence, a word of caution may not be amiss.

Be careful not to pack moulded pieces too tight; leave at least an inch all around for tissue or padding. Don't pack this tissue or padding too tight either. It must be fairly loose if it is to act as a cushion.

Under no circumstances, keep your moulded pieces in a cold room or any room that is under 68° Fahr. This is highly important. If your pieces are "frozen" or even chilled before you ship them, they will crack and break. Take them out of a room that is around 70° F. and you will find that you will have fewer broken pieces.

It does not pay to mould large pieces too thin. Pack up your goods as soon as you take them from the moulds. Don't leave them standing around the factory. You will have considerable breakage if you do. And if you check up the temperature of your moulds before you put in your chocolate, it will save a large number of discolored pieces.

Western Confectioners' Association Elects New Officers

A. C. BAKER

A. C. Baker of Denver was elected president of the Western Confectioner's Association. He succeeds Harry L. Brown of Tacoma.

R. I. Stone of the Stone Candy Company, San Francisco, was chosen first vice president, Alfred Beaudry of Los Angeles, second vice president, and L. C. Blunt of Denver secretary-treasurer. Invitations for the next convention from Los Angeles and Seattle will be acted upon within a month.

The confectioners voted in favor of the industry's continuing its campaign of national advertising in which $850,000 is to be spent over a three-year period.

Introducing "Rainbow Mix"

A new product is now offered to the confectionery trade by the Crown Fruit & Extract Co., Inc., of New York. This is "Rainbow Mix," a drained fruit possessing all the colors of the rainbow. To the confectioner seeking something new in fruit for center work, marshmallow eggs, etc., this product should suggest many interesting possibilities.

The Annual Dinner and Dance of Fritzsche Brothers, Inc., took place at the Pennsylvania Hotel in New York on the evening of January 18th and was one of the most successful ever held by the organization.

Pressing Cocoa Butter

(*Continued from page* 50)

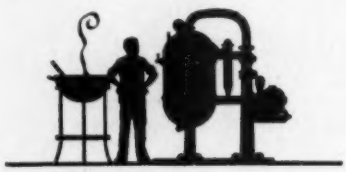
ter with a melting point well over 90° F. (mostly around 93° and 94°), and which is bland and without odor or flavor to clash with the flavor of the chocolate blend, which has excellent keeping qualities, and which gives such a high yield that these qualities are often obtained at a reduced cost, is too near the ideal to be long overlooked.

The solvent extract method of obtaining fats has been in use for many years in the oil industry; its use has been confined to those fats which are naturally hard to extract or those contained in the press-cake of oil-bearing materials from which most of the fats have been taken by pressure. Until recent years, its use has been confined entirely to Europe for the extraction of butter from cocoa shell and refuse. "Shell" butter has been known and used there for a long time, at best a poor substitute for the real thing. A few years ago, the high price of cocoa butter drew attention to the possibilities of the method and a large number of plants were erected for the purpose, while others possessing the necessary facilities proceeded to apply them in that direction.

The raw material used by these organizations was invariably that which was unusable for any other purpose. This, in itself, would not have been detrimental to the process had any effort been made to make the product obtained from them edible. This applies particularly to those operating in this country, since most of the European houses had gradually learned to make a product every bit as good as butter pressed in the ordinary way. The result has been that now that the possibility of 40 cent cocoa butter is temporarily past, and frantic butter users have calmed down somewhat, this type of butter is used only by soap makers.

Solvent Process Necessitates Subsequent Refining

The extraction process is apparently the simplest of them all, and indeed it is if the process is carried no farther than getting the butter out. But a description of the method will show how deceptive these appearances are, and why the method failed to become popular and fill the niche awaiting it. Solvent extraction is accomplished as follows: the fatty material—beans,



press-cake, expeller-cake or refuse—is broken up and placed in a receptacle. . A solvent, or fluid which will dissolve fat, is next passed through the mass until all of the fat is in solution. Then the solvent is evaporated from the mixture, leaving the cocoa butter behind. That is the basic part of the method, and to a great extent was all that happened to the solvent butter with which the American manufacturer is familiar. To be sure, some attempt was made to get rid of the flavor of the solvent—with varying success—but no attempt was made to get rid of the other non-butter products which came over with it in the process, and which, even if not apparent when the butter is fresh, later develop an entirely new and distressing set of troubles.

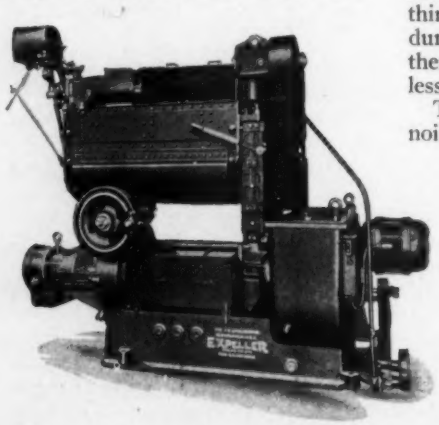
The solvent which has proved most efficient is petroleum benzine, but it is these other soluble compounds which cause the troubles referred to. All of the free fatty acids, acrolein and hydrolytic products, gums, stray soaps and the partly or over-developed constituents of the bean, come over with the fats. Since they are to a great extent saturated compounds, "they pack a nasty punch." The fact that the materials used to begin with were the offal of the trade, beans which the Department of Agriculture had rejected, mouldy cake, anything even distantly related to cocoa beans, did not help materially. Now the quantity and variety of these compounds might be diminished if the butter is extracted from good beans but there are sufficient of these substances even in the best beans to cause trouble.

Cocoa butter obtained by the extraction method has to go through many further processes before it even approaches the cocoa butter with which the trade is familiar. It must be filtered with extreme care, strange odors must be evaporated off with the aid of steam under high pressure, free fatty acids must be precipitated in the form of soap and numerous other things must be done to the butter according to how bad the original product was; yet, strange to relate, if the cleansing is carried out properly by people who know what they are doing, the product will in all probability be better than the majority of so called "prime" cocoa butters on the market today.

Human Equation Important in All Processes

The same thing is true of this process as is true of all other cocoa butter processes; while the results obtained are to some extent dependent upon the raw materials used, even more depends upon the individual using them. The solvent process has been tremendously improved in the last few years; new and less odorous solvents have been developed; means have been found to take all of the solvent out of the extract, new means are being employed to take out the unwanted by-products; and the process is much more economical than was ever thought possible. Still, since the real function of this method is not yet appreciated, it will probably be some time before it is used as anything but a temporary expedient during times of high prices, and then only by the ignorant, the careless or the crooked.

There has been a great deal of noise in the chocolate and candy in-



The Expeller, which is doing a creditable job of fat extracting in a score of other industries.

Courtesy V. D. Anderson Co.

dustry lately—everyone telling the world how efficient the industry has become. There has been, without doubt, a marked reduction in labor costs through the use of modern machinery and methods, but not one movement has been made towards the more efficient balancing of products and the utilizing of waste materials. A large increase in the use of cocoa butter means, at present, that in meeting that demand, an equally large amount of cocoa powder will be manufactured and that a market will have to be found for it. A market for cocoa powder cannot be built overnight. Consequently, a frantic effort is made to sell the existing users—prices are cut and eventually that much cocoa cake is dumped or sold to extractors for soap and fertilizer, a tragic and uneconomic waste.

This unbalanced condition not only affects the price of cocoa powder, as at first glance might seem to be the case, it directly affects the price of cocoa butter. The cost of the cocoa beans used, the labor and other charges and profit have to come out of either one or the other —the cocoa butter or the cocoa powder. If one of them is given away, the other has to carry the entire load. The demand for cocoa powder has not and probably will not in the future keep pace with the demand for cocoa butter (witness the efforts now being made to press more butter out of the bean in order to reduce the possibility of loss in that direction).

Is There a Way Out?

The solution to the problem is comparatively simple. All of the materials are at hand, ready to be applied by the butter presser with foresight and the courage to break away from conservatism and prejudice. A balanced use of the three methods which we have discussed, plus the refining and finishing processes now in use in the food oil industries, provides the answer.

The present ridiculously low prices of cocoa powder are entirely due to the expansion of production too far in advance of demand. Under the suggested arrangement, the possibility of such a condition would be met by a switch to the expeller process with its higher yield and lower costs. Then the expeller-cake, instead of being made into cocoa powder, would be treated by the third or solvent process along with the offal of the industry. Thus a complete cycle would be attained, a cycle which would check such a condition as we now have, with its fluctuating prices, and which with the final refining and finishing processes, would insure a better and more standardized quality of cocoa butter at a lower price.

All of which you may dismiss as a pipe dream if you please. The final lineup may be entirely different from that outlined. Some part of it may be dropped and other possible processes added. But an adjustment is coming. The problems of the cocoa butter industry are too easy of solution to be allowed to stand over long these days, especially when the same set of problems bothered other industries and have been successfully solved.

A Day with the Almond Growers

(*Continued from page* 44)

the improper grafting of the sweet trees themselves. Many of the leading exporters in Spain and in Italy are either foreigners, or of foreign descent: Swiss, Dutch, Danish, German, Swedish, English and American, though there appears an increasing tendency for the export trade to pass into native hands.

(*To be continued*)

Manufacturers' Representatives Elect New Officers

The Association of Manufacturers' Representatives of New York have elected the following officers and directors for the year 1930:

President—Winfield H. Sawtelle of Corn Products Refining Company; 1st Vice-President—Paul S. Willis of Comet Rice Company; 2nd Vice-President, Harry Minard of C. F. Mueller Company; Secretary—J. A. Nelson of the Bon Ami Company; Treasurer—Warren Denman of Standard Brands, Inc.

The Board of Directors comprise:

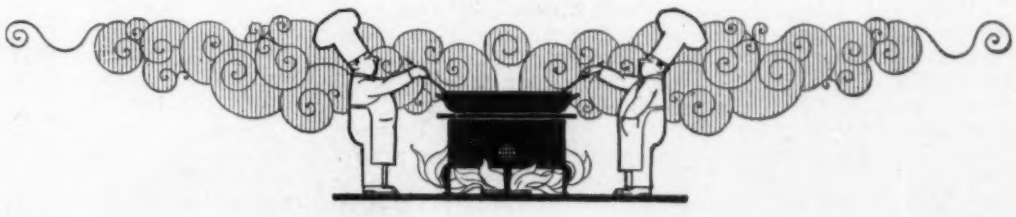
Chairman—Harry L. Adams of Borden Sales Company, E. M. Harbin of R. B. Davis Company, John N. Kane of Kellogg Sales Company, Wm. G. Mahrt of American Kitchen Products Company and F. C. Wurtz of Welch Grape Juice Company.

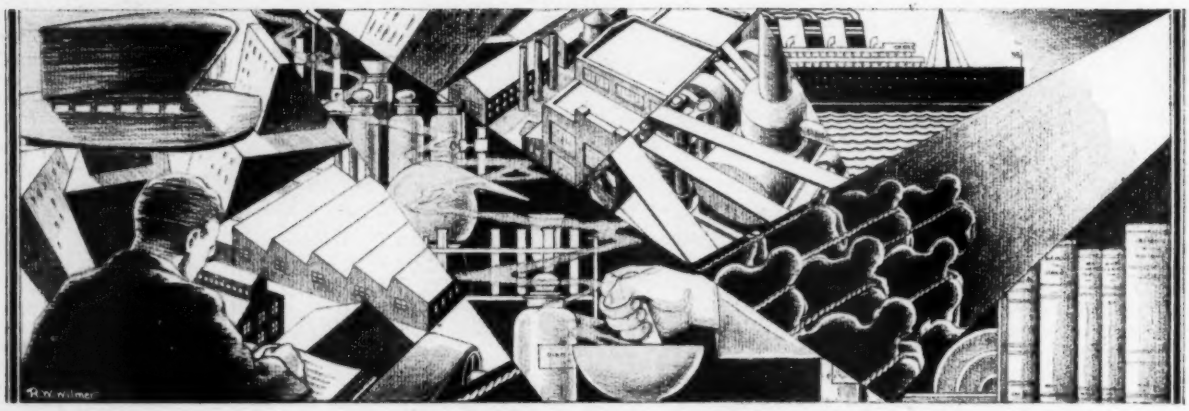
Under the new direction the Association looks for another progressive and prosperous year.

Once in a while we are asked for information which frankly stumps us.

After exhausting all available sources of information immediately at hand we are forced to call for help. Here is one now:

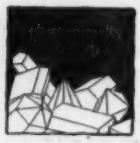
We are informed that there is an oil manufactured for putting a shine on chocolates which are to be used for display purposes. It is known as "Vexol." Can any of our readers furnish us with the name of the manufacturer of this product?





Monthly Digest of
CURRENT TECHNICAL LITERATURE

Vitamins in Food Materials,



Vitamins in Food Materials (including Candy Materials). *Circular No. 84, U. S. Department of Agriculture, by Sybil L. Smith.*

THIS circular contains tabulations showing the relative proportions of vitamins A, B and C in many food products, including a number of materials used in candy. Vitamin A is the anti-ophthalmic or anti-infective vitamin. It is essential for growth and well-being at all ages. A deficient supply of this vitamin leads to weakening of the body tissues and increased susceptibility to bacterial infection. Vitamin B complex is essential for the maintenance of appetite, growth, reproduction and proper functioning of the digestive system. In experiments with animals, complete absence of this vitamin caused loss of appetite, rapid loss of weight and death. Vitamin C is the anti-scorbutic vitamin. Complete absence of this vitamin leads to the well-known disease, scurvy.

In the following list of some of the materials used in candy the sign † indicates that the food material contains the vitamin mentioned; †† indicates that the material is a good source of the vitamin; ††† indicates that the material is an excellent source of the vitamin; — indicates that no appreciable amount of the vitamin is present; and * indicates that evidence is lacking or appears insufficient. The letters A, B and C refer to vitamins A, B and C respectively.

Relative Distribution of Vitamins A, B and C

Food Material	*A*	*B*	*C*
Cherries (canned)	††	††	*
Dates	†	††	*
Orange peel (outer)	††	†	††
Pineapple (canned)	††	††	††
Raisins	—	†	—
Skim milk powder	†	††	— to †
Whole milk powder	†††	††	— to †
Evaporated whole milk	†††	††	— to †
Glucose	—	—	—
Honey	—	—	—
Molasses	—	†	—
Sugar	—	—	—
Almonds	†	††	*
Brazil nuts	†	††	*
Butter	†††	—	*
Chocolate	—	*	*
Coconut	†	††	*
Coconut oil	— to †	—	—
Peanuts	†	††	*
Pecans	†	††	*
English walnuts	†	††	*

Editor's Note.—It is important to observe that the saccharine ingredients of candy, such as glucose, honey and sugar, do not contain vitamins A, B and C, and molasses contains only vitamin B. However, in advertising and publicity relative to candy as a wholesome food containing various nutritive elements, stress can be placed on the vitamins supplied by milk, fruits and nuts. Sugar and glucose provide carbohydrates and are primarily responsible for the structure of candy. Other ingredients supply fat and protein and Vitamins A, B and C as indicated above. Consequently, there is a good basis for emphasizing the all-around food value of candy.

"Militant Business"

Food Manufacture, vol. 4, p. 184 (1929).

THAT the application of research to American business is viewed in a thoroughly practical light is evident from a leaflet entitled "Militant Business" issued by an industrial organization. It is pointed out that the benefits that flow from practical, applied research are not confined to any one type of business—manufacturing, banking, insurance, public utility, transportation and service concerns have equal need for it, and can use it with equal success. Research is not a luxury, to be enjoyed only by academic workers on one hand and huge corporations on the other. It is applicable to all business concerns—sick or healthy, and *regardless of their size.* It is an intensely practical means of securing more profits and then insuring those profits.

Broad adoption of research by business is inevitable, and those concerns quickest to embrace it will reap the earliest benefits. However, research will not achieve "broad

adoption" until it is employed by the *average* concern, and until all forms are operating—i. e., management, technical and marketing research. A manufacturer would not use cost accounting for but one of his products and guess at the cost of the rest; no more should he use one kind of research and ignore the other kinds.

Most of the companies making large profits in this period of "checkered" prosperity have adopted research. But it should be recognized that these concerns did not employ research *because* they were big—they used it to *get* big. Research is merely *organized progress.*

Production of Oil of Peppermint in California

Anon. The Spice Mill, vol. 52, *p.* 1680 (1929).

THE distillation of oil of peppermint is being carried on in Kings Co., Calif. The quality of the mint grown in this section of the state is pronounced by experts to be very fine. The mint plants require much care while growing, as no foreign plants or grasses are permitted in the field. When ready to harvest the plants are mowed and dried in the field. The dried leaves and stalks are raked up and hauled to the still where they are placed in wooden tanks and subjected to a steaming and boiling process which extracts the oil.

Grape Juice in the Form of Powder

By P. H. Richert, University of California. The Fruit Products Journal and American Vinegar Industry, vol. 9, *p.* 39 (1929).

NUMEROUS experiments have been made for the purpose of obtaining grape juice in the form of a powder similar to milk powder, using spray driers and drying equipment of other types. Such efforts heretofore have been without success.

Recent investigations at the University of California now indicate that the problem can be solved. The best results were obtained by adding dextrose (corn sugar) in the ratio of one part dextrose to one part grape juice solids. The quite porous, brittle solid obtained by drying is then ground to a powder. When dextrose is used to the extent of 60 or 70 per cent the material can be dried in a dehydrator with success, provided the product is in semi-solid form when placed in the dehydrator.

The product does not deteriorate with age, is completely soluble in water and gives a solution with a color comparable to that of the original juice. It is just possible that this product might be used in creating new varieties of candy.

Vitamins in Confectionery

British Patent No. 276,860 to D. McKinlay; Food Manufacture, vol. 2, *p.* 251.

CHOCOLATE and other confectionery is treated after manufacture with ultra-violet rays from a quartz mercury vapor lamp to increase the vitamin content to an amount corresponding to or in excess of that of the original ingredients in a raw state.

Coloring Matters in Food

(Including Candy)

F. W. Andrews, British Dyestuffs Corpn., Ltd. Food Manufacture, vol. 2, *p.* 283.

ONE of the chief causes of fading of candy, apart from light and heat, is the use of glucose which has been bleached with sulphur dioxide to such an extent that sufficient traces remain in the candy. The dye Orange I should not be used unless the batch is acidified before adding the color. The most suitable colors for candy are as follows (under the English food law, please note; some of these are not permitted under the U. S. pure food laws): tartrazine, Ponceau 3R, Ponceau 2R, amaranth, rhodaminee, carmoisine, indigo carmine.

Considerable difficulty is often experienced in coloring glacé cherries owing to the large amount of sulphur dioxide present in the cherries as imported. An endeavor is usually made to remove as much as possible by steeping the cherries before boiling in the syrup, but there is generally sufficient left behind to bleach any of the colors which are susceptible to sulphur dioxide. The best color for glacé cherries is erythrosine or, as an alternative, dyeing with Ponceau after the sulphur dioxide has been "killed" in the manner described.

Specifications for Sugar

U. S. Government Master Specification, issued by the Federal Specifications Board as Specification No. 579b.

REQUIREMENTS for two grades of sugar are included, viz.: Type A, pure fine granulated of not less than 995.5 per cent sucrose; Type B, pure powdered confectioners' XXXX, with or without edible starch, not to exceed 3 per cent; inspection, when required, to be by methods of the Association of Official Agricultural Chemists.

Cocoa Butter Substitutes

Food Manufacture, vol. 4, *p.* 174 (1929).

NEW German regulations permit the use of substitutes for cocoa butter in certain confections without declaring their presence on the label. Up to the present this is true only for "Ice-Cream Chocolate" and for certain liquid filled bonbons covered with chocolate. The substitutes must be of vegetable origin and are usually coconut oil and sometimes peanut oil.

It has been found by an English firm that a good "bitter" chocolate can be made without any cocoa butter or substitute by the addition of an adequate quantity of soya flour.

Artificial Confectionery Flowers

British Patent No. 273,192 to W. Loeben; Food Manufacture, vol. 2, *p.* 251.

AN artificial flower has a solid center of chocolate or other sweetmeat enclosed in tin foil or the like and interchangeable.

New Fruit Food Preparations

California Fruit Growers' Exchange, Los Angeles; Food Manufacture, vol 2, p. 330.

FRUIT preparations are made by dissolving a colloid, such as pectin, agar, gelatine, etc., in the juice, adding, if desired, milk sugar or other sweetening or flavoring substances and then spray drying. Lemon or orange juice, or mixtures of the two, may be used and the product may be in the form of powder, granules or flakes.

New Dried Fruit Juices and Possible Use in Candy

Food Manufacture, vol. 4, p. 174 (1929).

SUCCESSFUL experiments have been made at Budapest, Hungary, in drying fruit juices in the same way that milk is dried: The juices (grape, apple) contain approximately 77 per cent water, 20 per cent sugar and 0.4 per cent protein. The fine powder obtained by the spray process and dried at 55° F. to 104° F. dissolves readily in water and then possesses all the properties of the fresh juice with its aroma, taste, physiological action and vitamin content. The dried product is said to keep indefinitely. (*The possibility of using such powdered fruit juices to create new types of candy is worth investigating.—Editor.*)

Captivating Continental Candy Containers

Food Manufacture, vol. 2, p. 291.

DESCRIPTIONS and photographic reproductions are given of some of the most unique and most attractive candy packages seen in window displays at a popular Swiss winter sports resort. A principle which does not seem to have received sufficient general consideration was here shown in practice—that of using one color design and massing the packages in the display window.

A window in browns was singularly attractive. This contained packages of chocolates. The conventional flower designs were in two shades of brown with gold edging, stems and leaves in black, leaves with gold edging, and gold berries. The whole was printed on glossy white paper; the ribbon used was orange with black edging.

Another enticing display consisted of flat boxes containing fruit jellies. The very attractive lid design immediately caught the eye and, in packages with lids removed, the display of jade-green, orange, lake, sepia, purple or white, molded into the shape of the fruit represented, was sufficient to make an immediate sale. The lid design was carried out in flat tints of sage-green, wine-red, orange, and a dark plum-red on a white background. The flat colors made a design of great strength and compelling interest.

Possible Use of Milk Sugar in Candy

E. O. Whittier and S. P. Gould of the Bureau of Dairy Industry, U. S. Dept. Agriculture, discuss the advantages of the use of milk sugar in candy in an article appearing in Industrial and Engineering Chemistry, vol. 22, p. 77 (1930).

THEY measured the tendency of the sugars lactose (milk sugar), sucrose (cane sugar), dextrose (corn sugar) and galactose to absorb moisture from the air.

It was found that milk sugar absorbs moisture much less readily than cane and corn sugars. Their figures show that cane sugar will absorb moisture from the atmosphere when it is more than 77.4 per cent saturated with water vapor, but that the atmosphere must be more than 93.1 per cent saturated before milk sugar can absorb water from it. Corn sugar and galactose absorb moisture from the atmosphere when it is saturated with water vapor to the extent of 81.0 per cent and 86.1 per cent, respectively.

These figures show that milk sugar absorbs moisture to a much less extent than either cane sugar or corn sugar—an advantage in candy that is readily apparent. The comparatively low degree of sweetness of milk sugar would be an advantage in some respects and in any event it would be used in conjunction with other sugars of greater sweetness. The general reputation of milk sugar as a healthful sugar is an additional point in its favor.

If the demand for this sugar should become sufficient to insure continuous large-scale production, its cost could undoubtedly be decreased considerably. (*The use of some milk sugar in hard candy for the purpose of reducing absorption of moisture, graining and stickiness has been proposed, but it is not known how successful this has been in practice.—Editor.*)

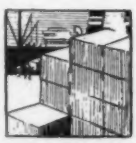
Use of "Block Milk" in Chocolate and Caramels

Food Manufacture, vol. 4, p. 175 (1929).

A NEW milk product has recently appeared in Germany which is intended for use in chocolate and caramels. It is an evaporated milk of low moisture content compressed into a solid block and covered with a thin layer of cocoa butter which acts as a preservative and which consists of about 1 per cent of the total mass. The milk is prepared in similar fashion to the fluid evaporated milks, using 10 per cent sugar before evaporation, but more water is removed from the product.

It is a compressed grayish white powder, containing 15 per cent fat, 11 per cent moisture and about 40 per cent sugar. An important difference is to be noticed in the lessened exposure of the block milk to the air, which prevents the changes in chemical composition due to oxidation by the air and causes retention of the original flavor. Because of the large sugar content it is cheaper than powdered milk. Because of its lower moisture content it is much more stable than condensed or evaporated milk. The product is recognized in the German tariff regulations as "Fat-coated Block Milk."

Chocolate Yeast Preparations



British Patent No. 276,926 to C. Doctor; Food Manufacture, vol. 2, p. 251.

A YEAST tablet comprises layers of dried chocolate powder intimately pressed into association with dried or powdered yeast so as to form a protective envelope for the yeast and impart to it a palatable flavor. The layers may be compacted

in a die-plate by hand pressure devices or by power driven tablet making machinery, the dried chocolate powder being fed from hoppers above and below the yeast layer.

Better Flavor Developed in Cocoa by Improved Roasting Methods

By Frank C. Gephart. Food Industries, vol. 1, p. 62.

OF all the manipulations used in the manufacture of products from cocoa the roasting of the beans is perhaps the most important step in the preparation of the great variety of chocolate products found on the market today. Improvements in the mechanical design of roasters represent an important advance. Roasters of recent design utilize the principle of the internal application of heat into an insulated revolving cylinder possessing regulated ventilation, which unquestionably results in more efficient roasting. Considerable scientific work has been done on the changes in composition caused by the process of roasting. Apart from anticipated changes, such as loss of moisture and caramelization of starch, it is well agreed that there is a loss of astringency due to some change in the tannin compounds present. It has been reported by several and disputed by an equal number that there is a loss of theobromine. The question is a difficult one to decide as raw beans present difficulties of analysis not shown by roasted beans. Prolonged roasting results in a loss of fat.

By far the most important change caused by roasting is the development of the aroma of the product. Raw fermented beans, as received at the factory, possess an odor resembling vinegar, due to the presence of acetic acid and acetic acid esters produced during the process of fermentation which are not wholly removed by the subsequent washing and drying processes. The more readily volatile esters and acids escape while roasting proceeds and the roast is considered to be complete when the "vinegar" odor is no longer discernible. At this stage it is considered that the true aroma of chocolate has been developed.

In developing the aroma it is assummed that some chemical change has taken place between the various constituents of the bean which produces the net result—the aroma of chocolate. It might be assumed equally well, especially in the absence of scientific facts to the contrary, that the resulting flavor of chocolate is not the result of interaction of the various constituents brought about by heat, but that it is merely the residual flavor of the unroasted beans which has not been volatilized by heat. A certain amount of credence is attached to this idea because variations in roast, both in respect to temperature and duration, produce in the same bean a variation of aroma. Furthermore, the manner and sequence of the roast affects the aroma of the product as is shown by the Lindt chocolate the flavor of which is developed slowly by heat treatment following a low initial roast and is totally different from that which would result from a short, high roast.

The most valuable work that has been done on the subject of chocolate aroma is that of Bainbridge and Davies in the factory of Cadbury in England. They subjected about 5,000 pounds of low roasted Caracas beans to steam distillation and were able to recover a little less than 1 ounce of volatile oil from the distillate. This oil possessed a remarkably true chocolate odor and high chocolate flavoring properties. The purpose of this investigation was to determine the chemical composition of the odorous principle of chocolate. Although Bainbridge and Davies were unable to identify completely all of the constituents present, they did find a substantial amount of the compound d-linalool and noted that the distillates possessed an odor resembling coriander.

Roasting is considered to be the most important single operation in the manufacture of chocolate and certainly it is the operation that will either make or break the product. There is a great opportunity to apply further knowledge for the purpose of controlling this operation more effectively.

Chocolate the Colloid

(*Continued from page* 40)

chocolate, but it does materially help the subsequent grinding processes if it is thorough. Fine grinding *is* necessary at this point, however, if the liquor is to be used in the manufacture of cocoa powder. In the latter case it is the only grinding process. Neglect of this tends to make pressing extremely difficult as well as giving a powder which will not stay in suspension.

The final grinding or refining process is the one in which the colloidal or near-colloidal disintegration takes place. The mixture at this stage contains all of the ingredients except, perhaps, a part of the cocoa butter. The extent to which the characteristics of these ingredients are developed and blended depends entirely upon how finely the mass is ground.

Effect on Flavor

Fine grinding brings out the natural flavor of the bean part of the blend and effects a considerable saving in the use of added flavors. The sense of taste functions only when the flavor carrying body comes into direct contact with the taste nerves. As these nerve ends are minute in size, a small particle can create practically the same taste sensation as a large one. It is obvious then that a smaller quantity of a flavor which is finely ground will do the work of a much larger quantity not so finely divided.

Poor grinding at this stage produces a particle too large for the protective colloid to handle. Separation will continue to occur notwithstanding running in the finishers "till the cows come home." The resulting chocolate will also lack viscosity. Coating made from such a base will not string well, will run off the center, and be very prone to graying. Coatings of this type have been altogether too common in the past and, although the present average is considerably better, there is still too much of it around for the industry's good. The final eliminating of this sort of slip-shod coating is in the hands of users, for if it were not bought it most certainly would not be manufactured.

(*To be continued*)

Change in Corporation Name

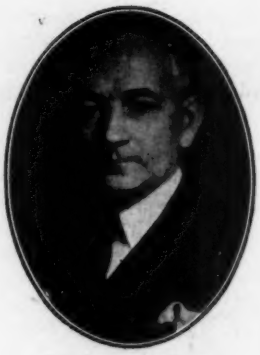
The Kimbell Candy Company is the new corporation name which the S. Pooley Company has assumed in order to acquaint its customers with the active owners of the business.

For the past ten years Mr. Frank J. Kimbell has been the active head of the business and has directed the policies which have established a reputation for honest and square dealing. Besides managing the affairs of the Kimbell Candy Company, Mr. Kimbell handles efficiently the position of Regional Chairman of the National Confectioners' Association.

The change in corporation name brings also an increased capitalization to permit of the necessary expansion caused by the increase in business. It is a close corporation, causing us to remark, that there is no stock being offered to the "dear public."

The change in name of the corporation will have no effect on its policies which have been, and always will be, to produce pure, wholesome, quality candies at moderate prices. They will, as in the past, be ever alert to improved methods and products to better serve the needs of their customers.

G. L. KING



C. M. BAKER

G. L. King and C. M. Baker Are Named Vice-Presidents of Lamont Corliss Co.

G. Lloyd King and C. M. Baker, widely known executives of Lamont Corliss and Company, have been made vice presidents of the organization.

Each has been with Lamont Corliss for more than 20 years, Mr. King since 1904 and Mr. Baker since 1907.

Mr. King, who at the present time is also sales manager and secretary of the organization, began his career as a junior salesman to the retail trade in New York. Later he went to Denver as resident representative, then to St. Louis as manager of the office there, and finally back to New York as a salesman, working gradually up to the office of sales manager, secretary and vice president.

Mr. Baker joined Lamont Corliss immediately after his graduation from Yale, in 1907. He entered the concern as a "sort of glorified office boy," to quote his own modest statement. Then he, like Mr. King, gradually worked his way up through various stages to his present office as vice president. In addition to this, he is also a vice president and a director of the Pond's Extract Company and secretary of the Peter Cailler Kohler Swiss Chocolate Company, manufacturers of Peter's, Cailler's, and Nestle's Milk Chocolates and Sportman's Chocolate Bracer.

Answers to this Month's Questions

1. Because the cocoa butter in the better mixtures ordinarily contains a higher proportion of the higher melting, or so-called "hard" fats; also, because such butter is likely to be more plentifully supplied with natural protective colloids.

2. Because the smaller the particles are ground, the greater the number of them which will come in contact with the sensory nerves to provide the sensation of taste.

3. To *colloidal dispersion*. It varies in proportion to the volume of solid matter suspended in the liquid phase. A coarsely ground chocolate lacks the body of one which is finely ground.

4. To the fact that the colloidal substances contained in the butter function as colloids during the process of cooling—up to the point at which the solid particles outnumber the liquid particles of the mixture and the mass becomes a semi-solid.

5. In 1928—0.5%; in 1929—1.4%. The last-mentioned figure represents approximately 40,000 bags.

6. It reduces the danger from frost and increases the probability of a large crop. Earlier blooms generally make for smaller crops.

7. Bari, Italy.

8. The trees are frequently propagated by seedling from bitter almond stocks. These trees subsequently require grafting with sweet almond trees. If this is not properly done, the same trees may produce bitter and sweet almonds at the same time.

9. An inferior grade of cocoa butter produced by the solvent method from cocoa shells and other refuse.

10. A process of removing the cocoa fat from unroasted cocoa beans by means of two horizontal worms rotating in a slotted barrel with a plate on one end. Tremendous pressure is developed as the nibs are forced through the restricted space between the plate and the barrel.